Ministry of
Transportation and
Communications

Ontario

MI-109

REPORT FOR

AGGREGATE AND SOILS REFERENCE SAMPLES, 1986

MATERIALS INFORMATION
ENGINEERING MATERIALS OFFICE

Ontario

Ministry of
Transportation and
Communications

Soils and Aggregates Section
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Central Building, Room 309
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Telephone: (416) 235-3740

87 04 29

File No.: 3162-2-5-3

To: Participants of the Soils and Aggregates Correlation Program

Re: **Aggregate and Soil Reference Samples 1.86, 2.86, 3.86, 4.86, 5.86, and 6.86**

Gentlemen:

Enclosed is your copy of the final report on the test results of aggregate and soil reference samples for 1986.

This data includes a table of results for your laboratory, as well as a set of scatter diagrams. Your laboratory number appears at the top of the table of results.

Yours truly,

Ian G. Bullen, Laboratory
Operations Supervisor.

IGB/jlo
Enclosures

NOTES ON DATA PRESENTATION

1. TABLE OF TEST RESULTS

a. Column 1 - This lists the test number as designated in the M.T.C. Laboratory Testing Manual and the individual test segments.

b. Columns 2 & 3 - List the individual data for the pair of samples. NT means not tested, and * means measurement rejected.

c. Columns 4 & 5 - List the mean test data for the pair of samples for all laboratories performing the test.

d. Columns 6 & 7 - List the "Standardized Deviate" for each test result. This is a measure of how close an actual test result is to the mean for all similar test results (for one sample). It is obtained by subtracting the actual test result (X_1) from the mean ($\overline{X}$), and dividing by the standard deviation(S). A negative sign means that the test result is smaller than the mean, and no sign means the test result is equal to or larger than the mean.

e. Columns 8 & 9 - List the "Laboratory Ratings", which, in effect, are similar to the "Standardized Deviate", but in a simpler numerical form.

The ratings are as follows:

5 - test result within $\frac{1}{2}$ standard deviation from $\overline{X}$
4 - " 1 "
3 - " $1\frac{1}{2}$ "
2 - " 2 "
1 - " $2\frac{1}{2}$ "
0 - test result has been rejected as an outlier.

As before, a negative sign indicates a result that is smaller than the mean.

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2. SCATTER DIAGRAMS

The points on these diagrams are designated by letters - each letter representing a laboratory. The points are located by plotting the value obtained for the first (odd number) sample on the horizontal axis against the value obtained for the second (even numbered) sample on the vertical axis. If the results from two or more laboratories happen to intersect at the same point, the symbols & or ? are used. An * represents a point which is off the chosen scale. The scales are chosen, wherever possible, to give the most informative display of the plotted points. If a point is off the scale, it does not necessarily mean that it is outside the limits noted above.

The horizontal and vertical dashed lines forming the cross on the plot represent the median values for the two samples.

The data below the scatter diagram consists of the mean, median, standard deviation, and standard error of the mean for both samples.

NOTE:

As data is obtained for additional pairs of samples, a graphical construction will be made of the laboratory ratings. This will give, at a glance, a picture of the laboratory performance, and will indicate error trends. These will be included with future reports. For further details on the correlation programs, please refer to the following reports:

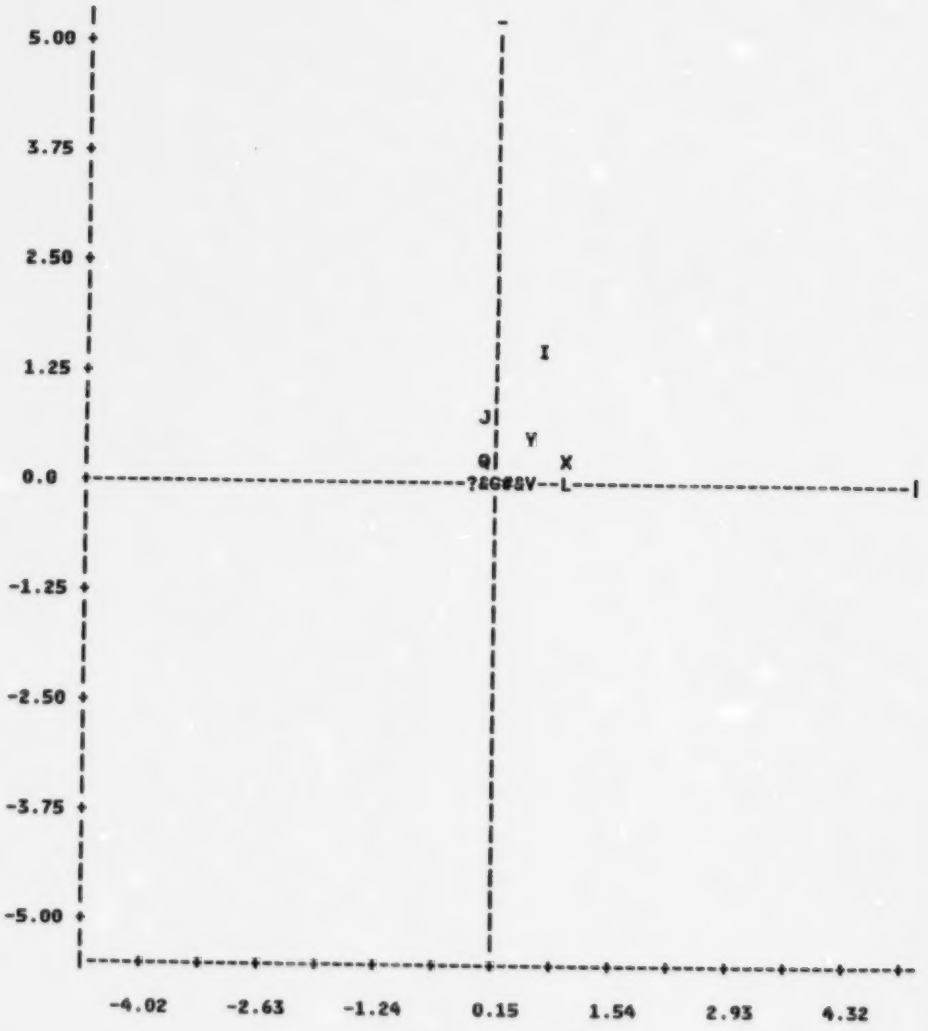
EM-30; "Interlaboratory Study of the Precision of Some Aggregate Tests - Interim Report", by C.A. Rogers & Lise Manchester; May, 1979.

EM-33; "The Development of an Interlaboratory Testing Program for Construction Aggregates", by Lise Manchester; December, 1979.

EM-47; "Interlaboratory Reference Sample Programs for Aggregate, Asphalt, Concrete and Soil Tests", by B. Chojnacki, C. Rogers, and J.I. McDougall; May, 1981.

TEST 2: PERCENT RETAINED ON 19 MM SIEVE (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.556 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



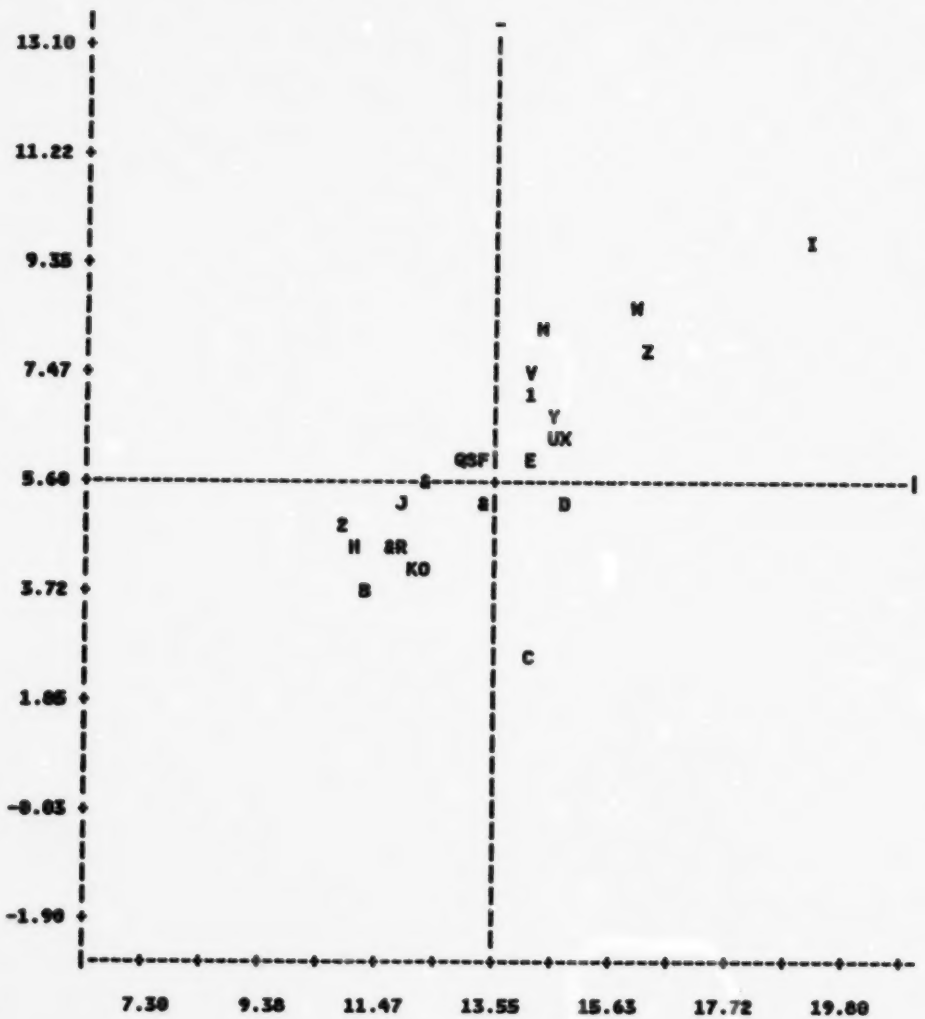
LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	0.289	0.114
MEDIAN	0.150	0.0
STANDARD DEVIATION	0.361	0.276
STANDARD ERROR OF THE MEAN	0.068	0.052

NO OF POINTS IN EACH QUADRANT
NE = 10
SE = 0
NW = 18
SW = 0

TEST 3: PERCENT RETAINED ON 16 MM SIEVE (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS — HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.833 UNITS=1 CM — VERTICAL AXIS: MATERIAL 2



LEGEND
======

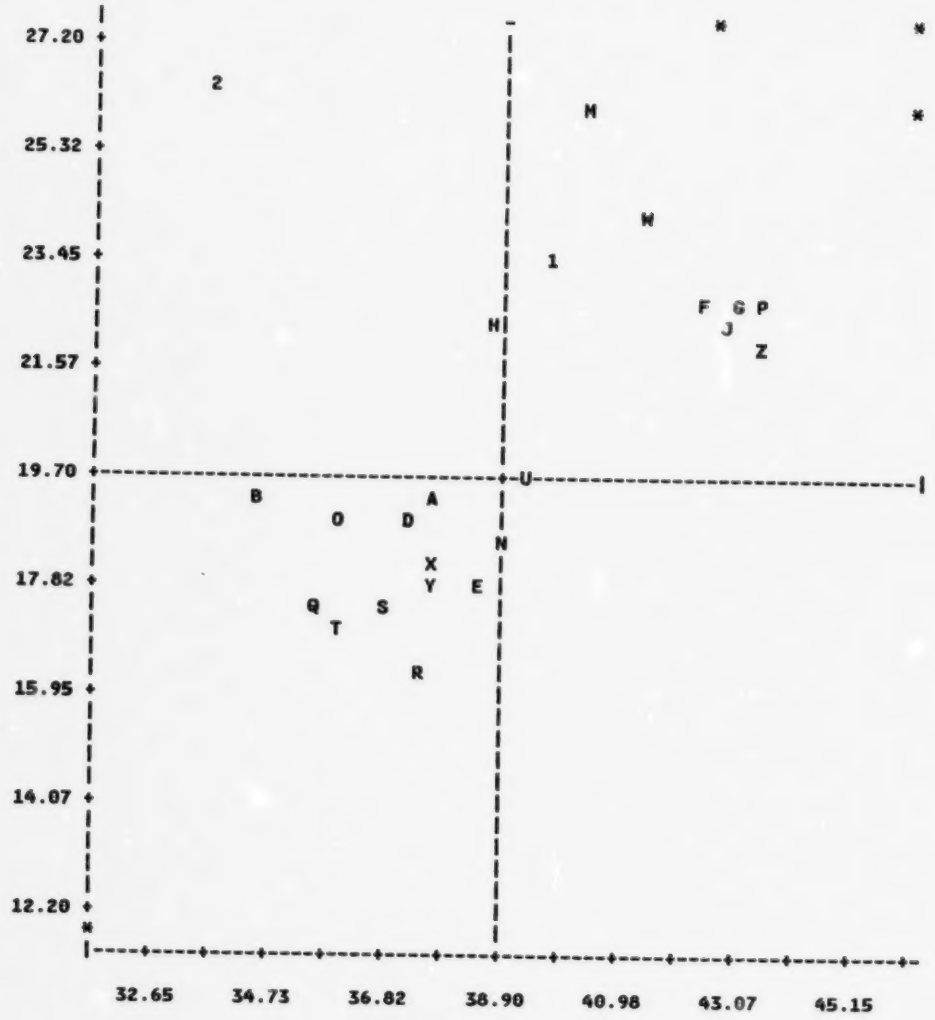
LAB. NO. 1	= A
LAB. NO. 4	= C
LAB. NO. 5	= D
LAB. NO. 14	= F
LAB. NO. 16	= G
LAB. NO. 23	= H
LAB. NO. 27	= I
LAB. NO. 38	= J
LAB. NO. 46	= K
LAB. NO. 50	= L
LAB. NO. 53	= M
LAB. NO. 56	= N
LAB. NO. 58	= O
LAB. NO. 60	= P
LAB. NO. 61	= Q
LAB. NO. 62	= R
LAB. NO. 63	= S
LAB. NO. 64	= T
LAB. NO. 66	= U
LAB. NO. 67	= V
LAB. NO. 68	= W
LAB. NO. 69	= X
LAB. NO. 70	= Y
LAB. NO. 71	= Z
LAB. NO. 72	= 1
LAB. NO. 74	= 2
LAB. NO. 6	= E
LAB. NO. 2	= B

	MATERIAL 1	MATERIAL 2
MEAN	13.657	5.743
MEDIAN	13.550	5.600
STANDARD DEVIATION	1.521	1.485
STANDARD ERROR OF THE MEAN	0.287	0.281

NO OF POINTS IN EACH QUADRANT
NE = 10
SE = 2
NW = 5
SW = 11

TEST 4: PERCENT RETAINED ON 13.2 MM SIEVE (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



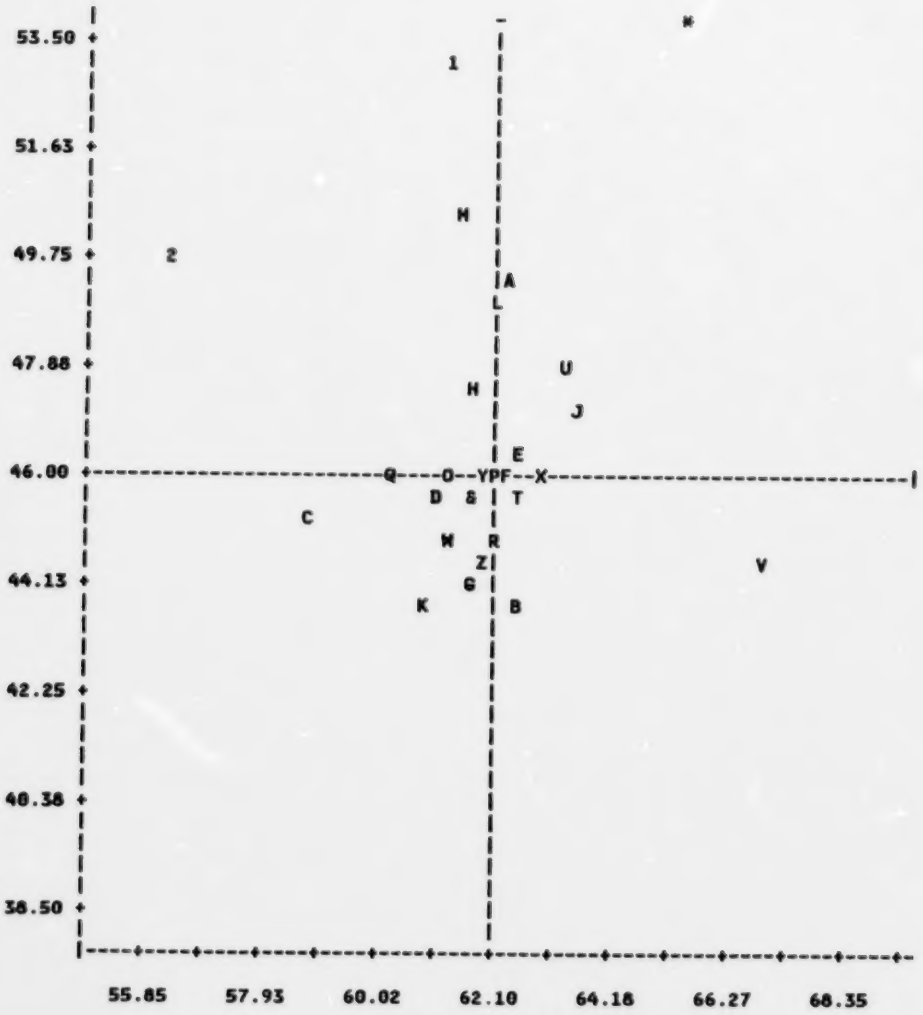
LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	39.530	20.904
MEDIAN	38.900	19.700
STANDARD DEVIATION	4.162	3.818
STANDARD ERROR OF THE MEAN	0.801	0.735

NO OF POINTS IN EACH QUADRANT
NE = 9
SE = 0
NW = 2
SW = 12

TEST 5: PERCENT RETAINED ON 9.5 MM SIEVE (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS — HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.833 UNITS=1 CM — VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1	= A
LAB. NO. 4	= C
LAB. NO. 5	= D
LAB. NO. 14	= F
LAB. NO. 16	= G
LAB. NO. 23	= H
LAB. NO. 27	= I
LAB. NO. 38	= J
LAB. NO. 46	= K
LAB. NO. 50	= L
LAB. NO. 53	= M
LAB. NO. 56	= N
LAB. NO. 58	= O
LAB. NO. 60	= P
LAB. NO. 61	= Q
LAB. NO. 62	= R
LAB. NO. 63	= S
LAB. NO. 64	= T
LAB. NO. 66	= U
LAB. NO. 67	= V
LAB. NO. 68	= W
LAB. NO. 69	= X
LAB. NO. 70	= Y
LAB. NO. 71	= Z
LAB. NO. 72	= 1
LAB. NO. 74	= 2
LAB. NO. 6	= E
LAB. NO. 2	= B

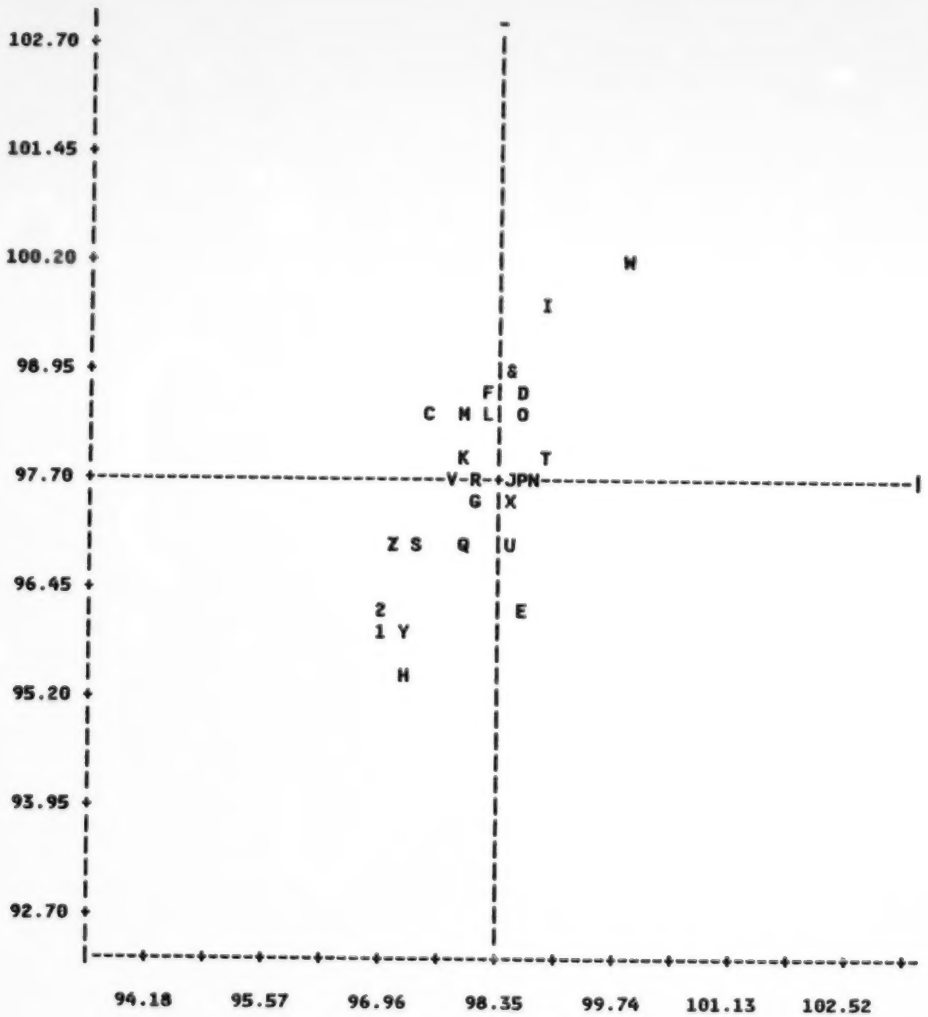
	MATERIAL 1	MATERIAL 2
MEAN	62.132	47.018
MEDIAN	62.100	46.000
STANDARD DEVIATION	0.763	1.680
STANDARD ERROR OF THE MEAN	0.144	0.317

NO OF POINTS IN EACH QUADRANT

NE =	6
SE =	3
NW =	9
SW =	9

TEST 6: PERCENT RETAINED ON 4.75 MM SIEVE (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.556 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
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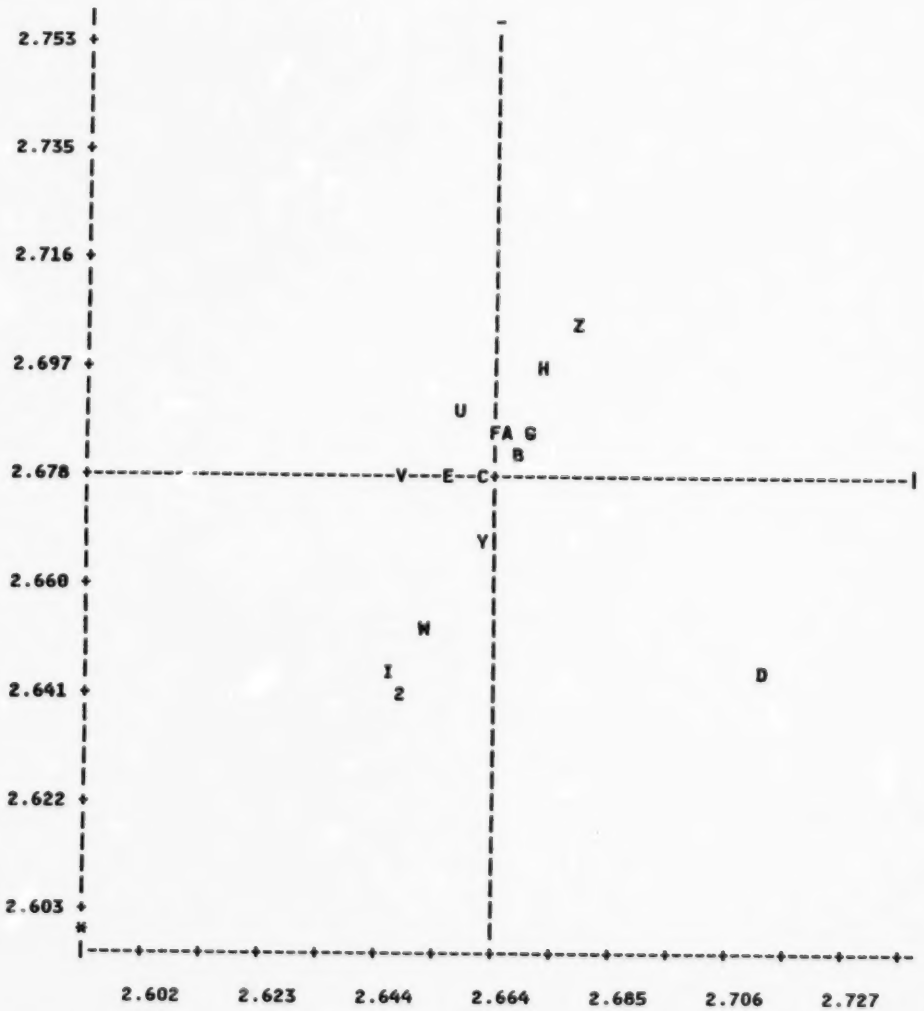
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	98.282	97.718
MEDIAN	98.350	97.700
STANDARD DEVIATION	0.707	1.065
STANDARD ERROR OF THE MEAN	0.134	0.201

NO OF POINTS IN EACH QUADRANT
NE = 10
SE = 3
NW = 7
SW = 8

TEST 9: RELATIVE DENSITY (COARSE AGGREGATE - BULKS.S .D.)
SCATTER PLOT ANALYSIS
SCALE: 0.008 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
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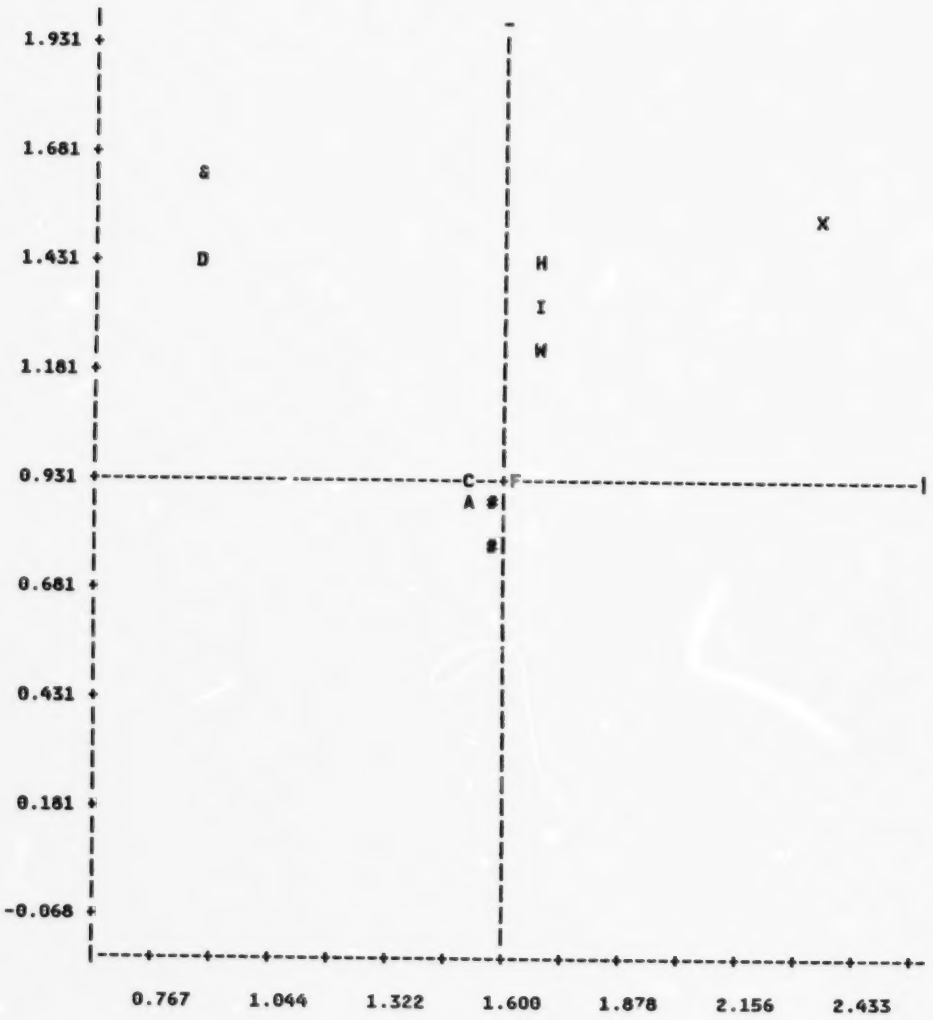
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	2.650	2.657
MEDIAN	2.664	2.679
STANDARD DEVIATION	0.010	0.019
STANDARD ERROR OF THE MEAN	0.003	0.005

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 1
NW = 5
SW = 4

TEST 10: ABSORPTION (COARSE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.111 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
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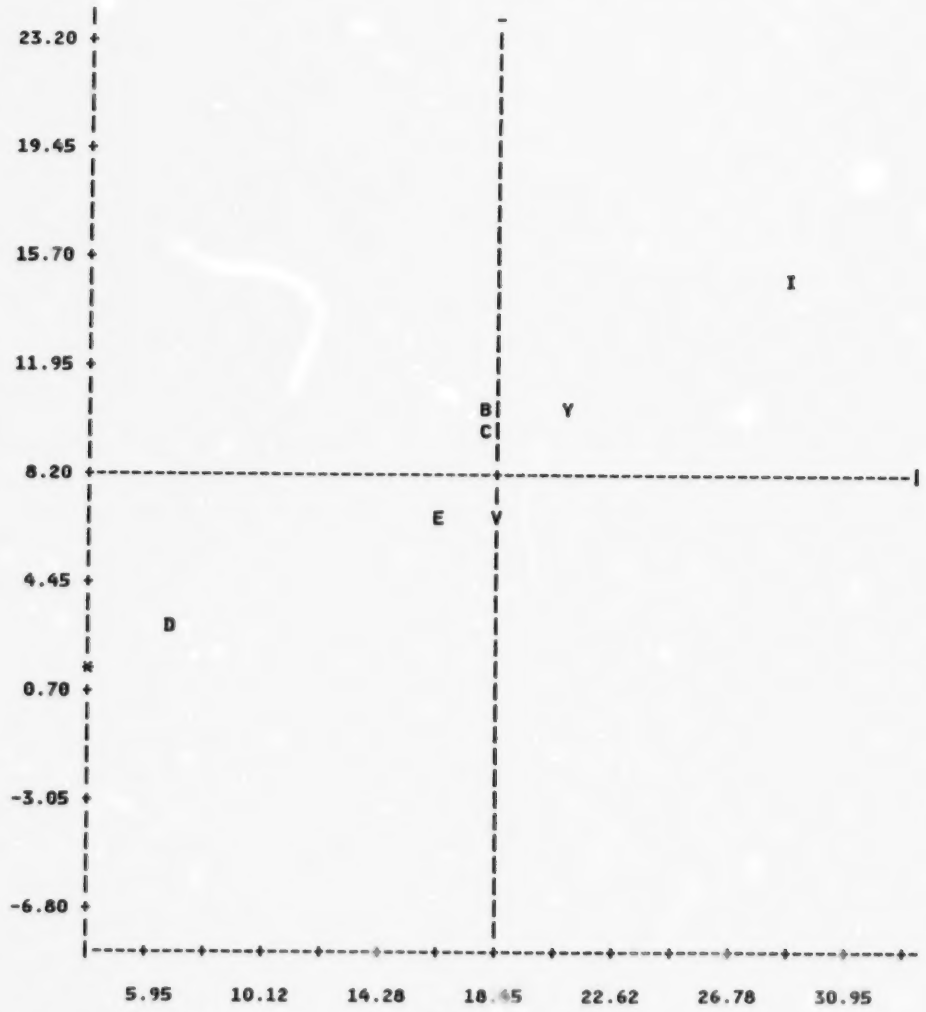
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	1.532	1.113
MEDIAN	1.600	0.931
STANDARD DEVIATION	0.372	0.304
STANDARD ERROR OF THE MEAN	0.093	0.076

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 0
NW = 4
SW = 7

TEST 11: MGSO4 SOUNDNESS (COARSE AGGREGATE - MTC RESULTS)
SCATTER PLOT ANALYSIS
SCALE: 1.667 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



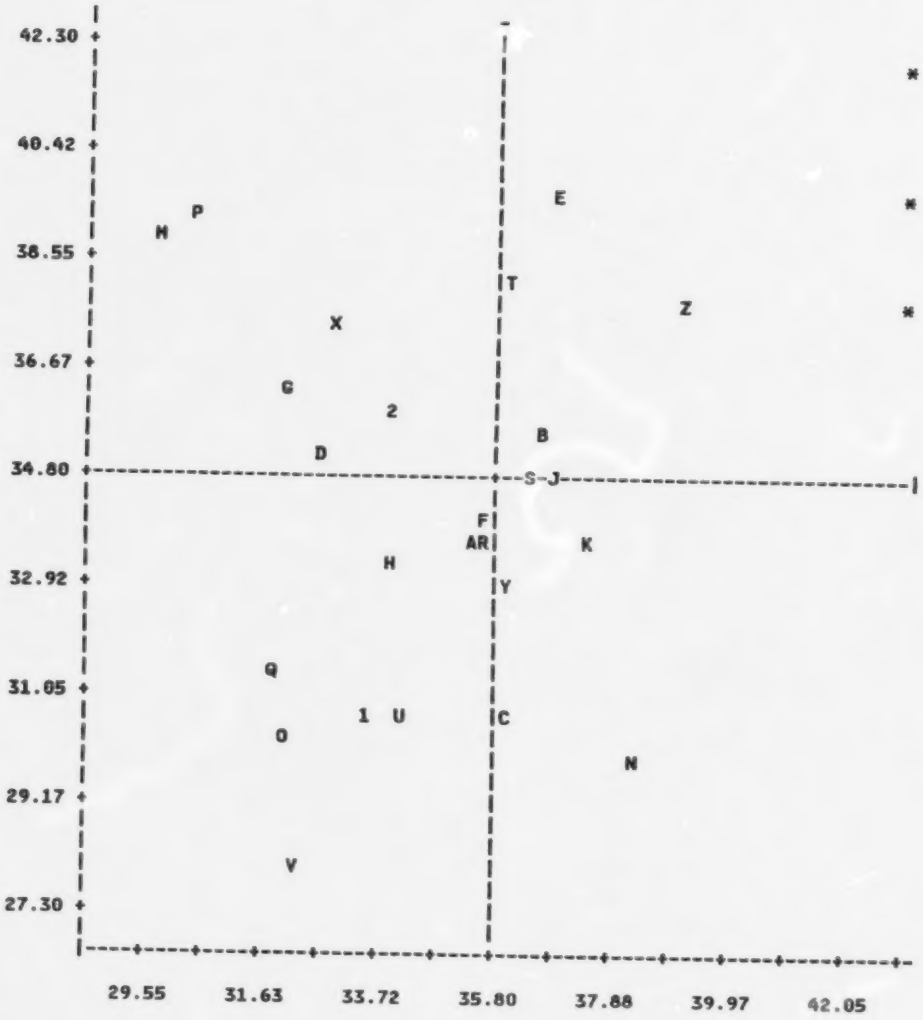
LEGEND
======
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 27 = I
LAB. NO. 67 = V
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	16.675	7.925
MEDIAN	18.450	8.200
STANDARD DEVIATION	8.198	4.198
STANDARD ERROR OF THE MEAN	2.899	1.484

NO OF POINTS IN EACH QUADRANT
NE = 2
SE = 0
NW = 2
SW = 3

TEST 20: PERCENT RETAINED ON 2.36 MM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
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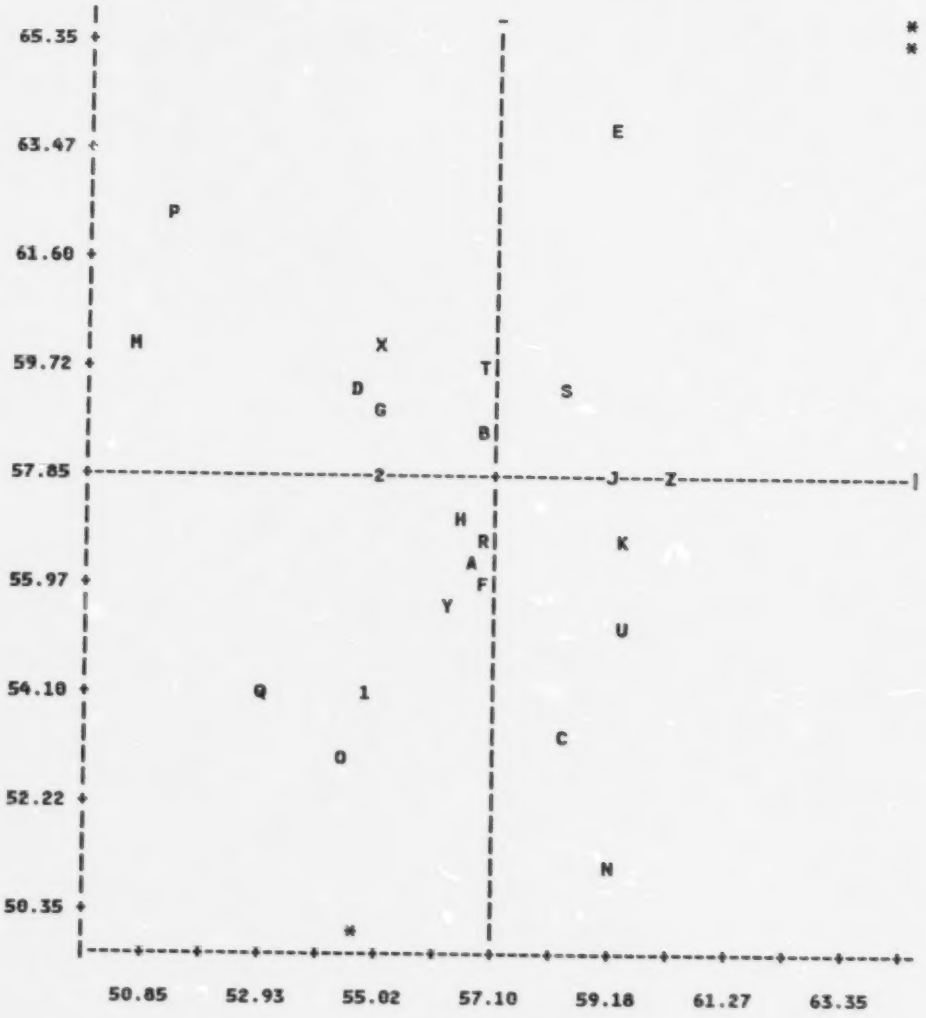
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	36.153	34.882
MEDIAN	35.800	34.800
STANDARD DEVIATION	2.502	3.318
STANDARD ERROR OF THE MEAN	0.473	0.627

NO OF POINTS IN EACH QUADRANT
NE = 6
SE = 4
NW = 6
SW = 9

TEST 21: PERCENT RETAINED ON 1.18 MM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

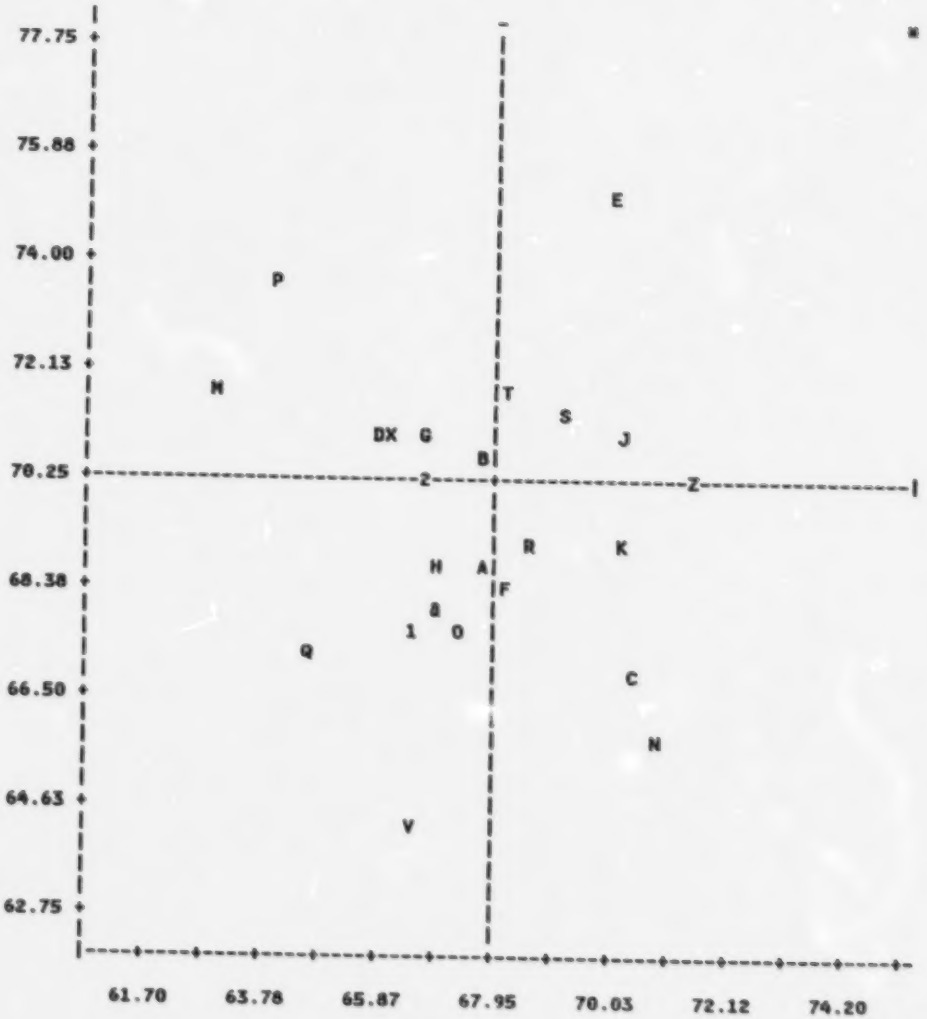
	MATERIAL 1	MATERIAL 2
MEAN	58.257	58.068
MEDIAN	57.100	57.850
STANDARD DEVIATION	2.579	3.614
STANDARD ERROR OF THE MEAN	0.487	0.683

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 4
NW = 8
SW = 8

TEST 22: PERCENT RETAINED ON 600 UM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

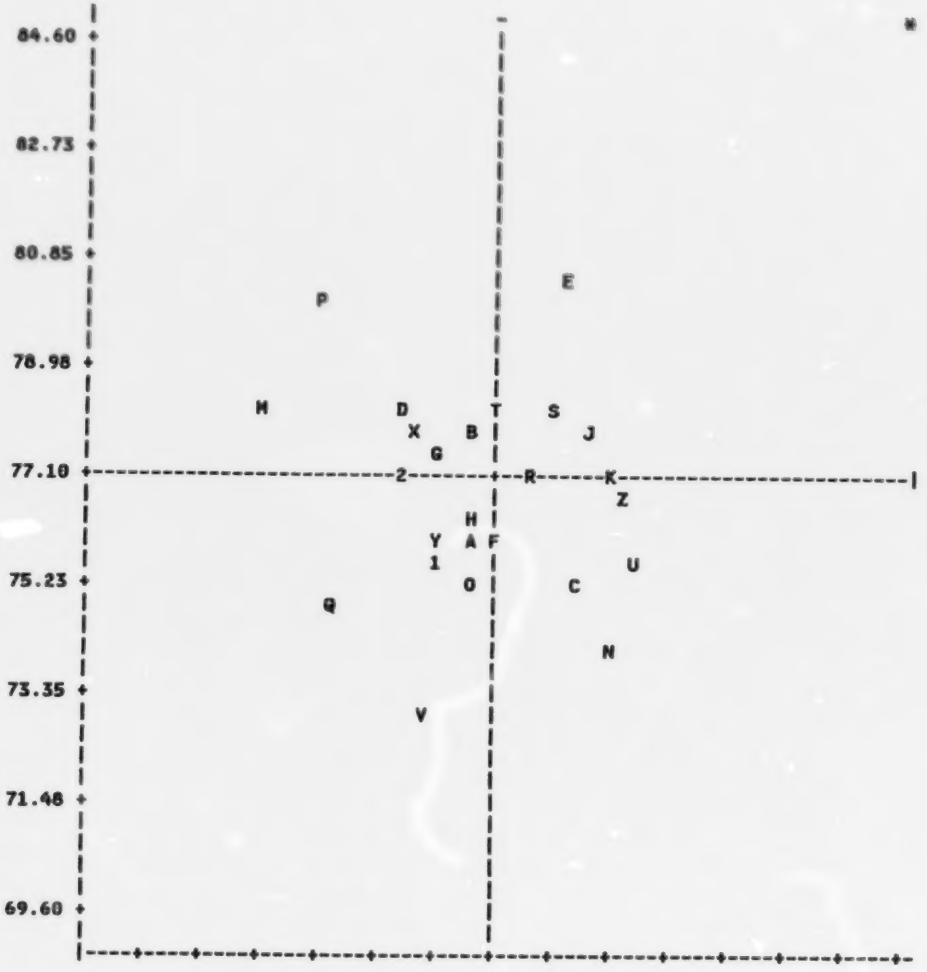
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	69.750	70.921
MEDIAN	67.950	70.250
STANDARD DEVIATION	2.198	2.277
STANDARD ERROR OF THE MEAN	0.415	0.430

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 5
NW = 7
SW = 8

TEST 23: PERCENT RETAINED ON 300 UM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND

LAB. NO. 1	A
LAB. NO. 4	C
LAB. NO. 5	D
LAB. NO. 14	F
LAB. NO. 16	G
LAB. NO. 23	H
LAB. NO. 27	I
LAB. NO. 38	J
LAB. NO. 46	K
LAB. NO. 50	L
LAB. NO. 53	M
LAB. NO. 56	N
LAB. NO. 58	O
LAB. NO. 60	P
LAB. NO. 61	Q
LAB. NO. 62	R
LAB. NO. 63	S
LAB. NO. 64	T
LAB. NO. 66	U
LAB. NO. 67	V
LAB. NO. 68	W
LAB. NO. 69	X
LAB. NO. 70	Y
LAB. NO. 71	Z
LAB. NO. 72	1
LAB. NO. 74	2
LAB. NO. 6	E
LAB. NO. 2	B

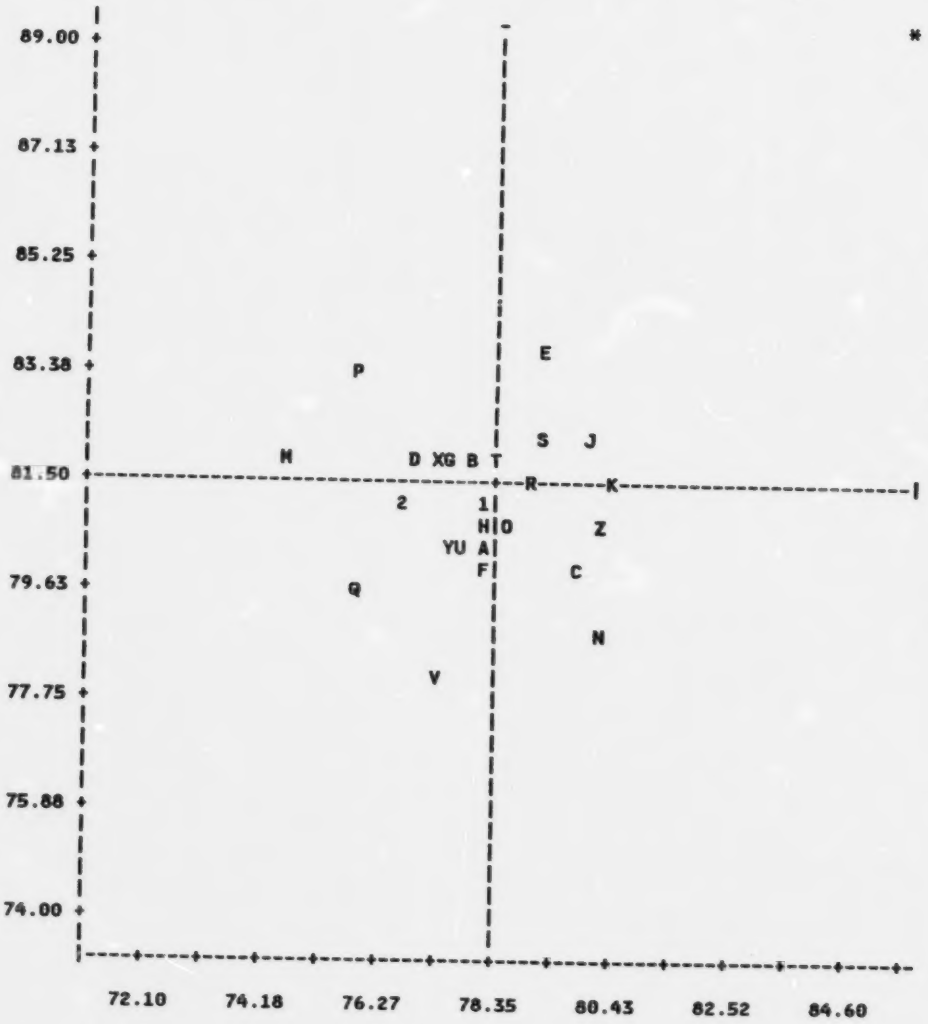
	MATERIAL 1	MATERIAL 2
MEAN	76.446	78.361
MEDIAN	74.550	77.100
STANDARD DEVIATION	1.820	1.622
STANDARD ERROR OF THE MEAN	0.344	0.307

NO OF POINTS IN EACH QUADRANT

NE =	5
SE =	4
NW =	8
SW =	8

TEST 24: PERCENT RETAINED ON 150 UM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO.	1	= A
LAB. NO.	4	= C
LAB. NO.	5	= D
LAB. NO.	14	= F
LAB. NO.	16	= G
LAB. NO.	23	= H
LAB. NO.	27	= I
LAB. NO.	38	= J
LAB. NO.	46	= K
LAB. NO.	50	= L
LAB. NO.	53	= M
LAB. NO.	56	= N
LAB. NO.	58	= O
LAB. NO.	60	= P
LAB. NO.	61	= Q
LAB. NO.	62	= R
LAB. NO.	63	= S
LAB. NO.	64	= T
LAB. NO.	66	= U
LAB. NO.	67	= V
LAB. NO.	68	= W
LAB. NO.	69	= X
LAB. NO.	70	= Y
LAB. NO.	71	= Z
LAB. NO.	72	= 1
LAB. NO.	74	= 2
LAB. NO.	6	= E
LAB. NO.	2	= B

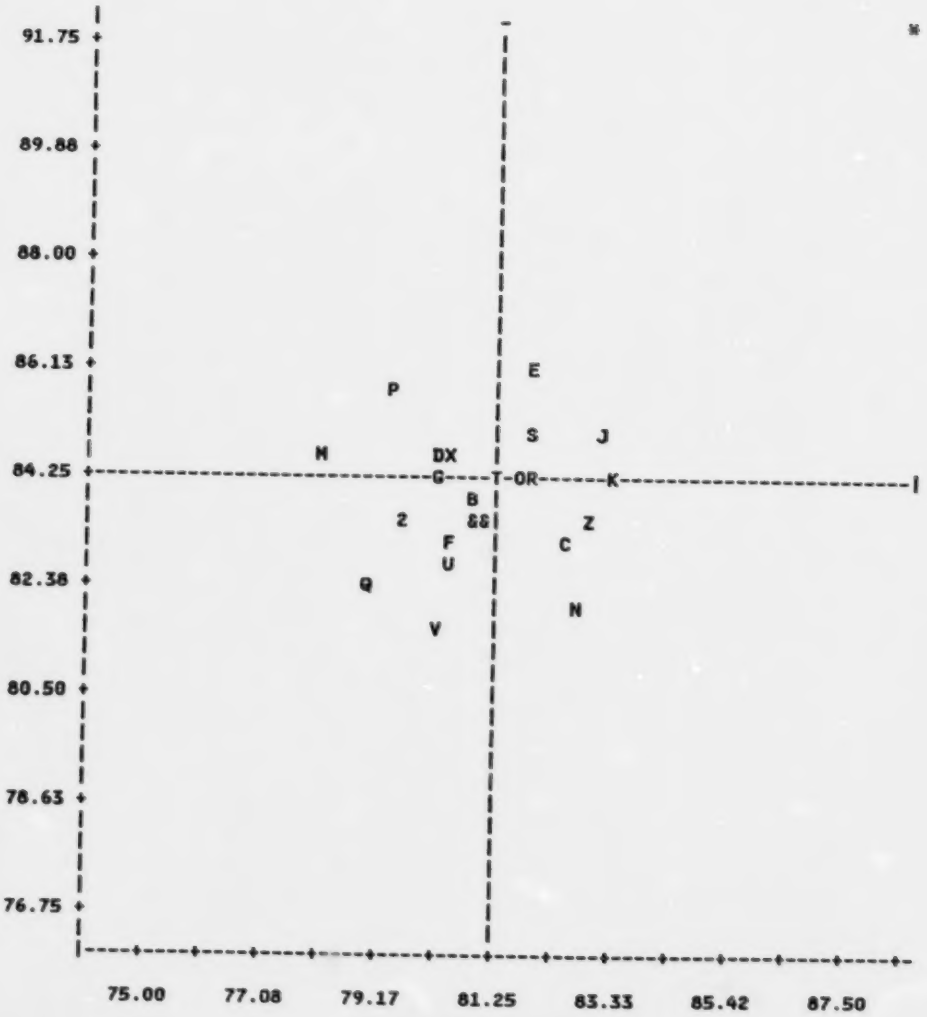
	MATERIAL 1	MATERIAL 2
MEAN	80.268	82.768
MEDIAN	78.350	81.500
STANDARD DEVIATION	1.492	1.202
STANDARD ERROR OF THE MEAN	0.282	0.227

NO OF POINTS IN EACH QUADRANT

NE =	5
SE =	4
NW =	7
SW =	9

TEST 25: PERCENT RETAINED ON 75 UM SIEVE (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



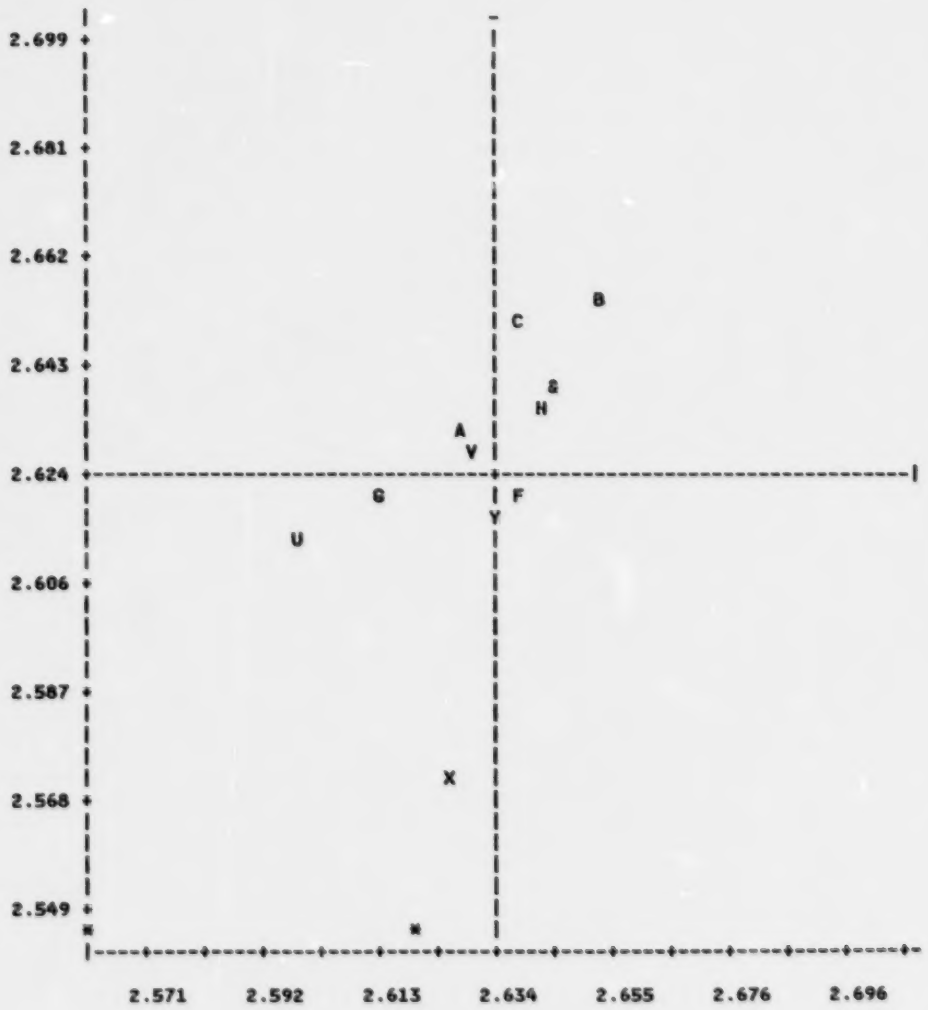
LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 46 = K
LAB. NO. 50 = L
LAB. NO. 53 = M
LAB. NO. 56 = N
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 61 = Q
LAB. NO. 62 = R
LAB. NO. 63 = S
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 72 = 1
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	83.211	85.604
MEDIAN	81.250	84.250
STANDARD DEVIATION	1.341	1.016
STANDARD ERROR OF THE MEAN	0.253	0.192

NO OF POINTS IN EACH QUADRANT
NE = 6
SE = 3
NW = 6
SW = 10

TEST 27: RELATIVE DENSITY (FINE AGGREGATE - BULK S.S. D.)
SCATTER PLOT ANALYSIS — HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.008 UNITS=1 CM — VERTICAL AXIS: MATERIAL 2



LEGEND
======

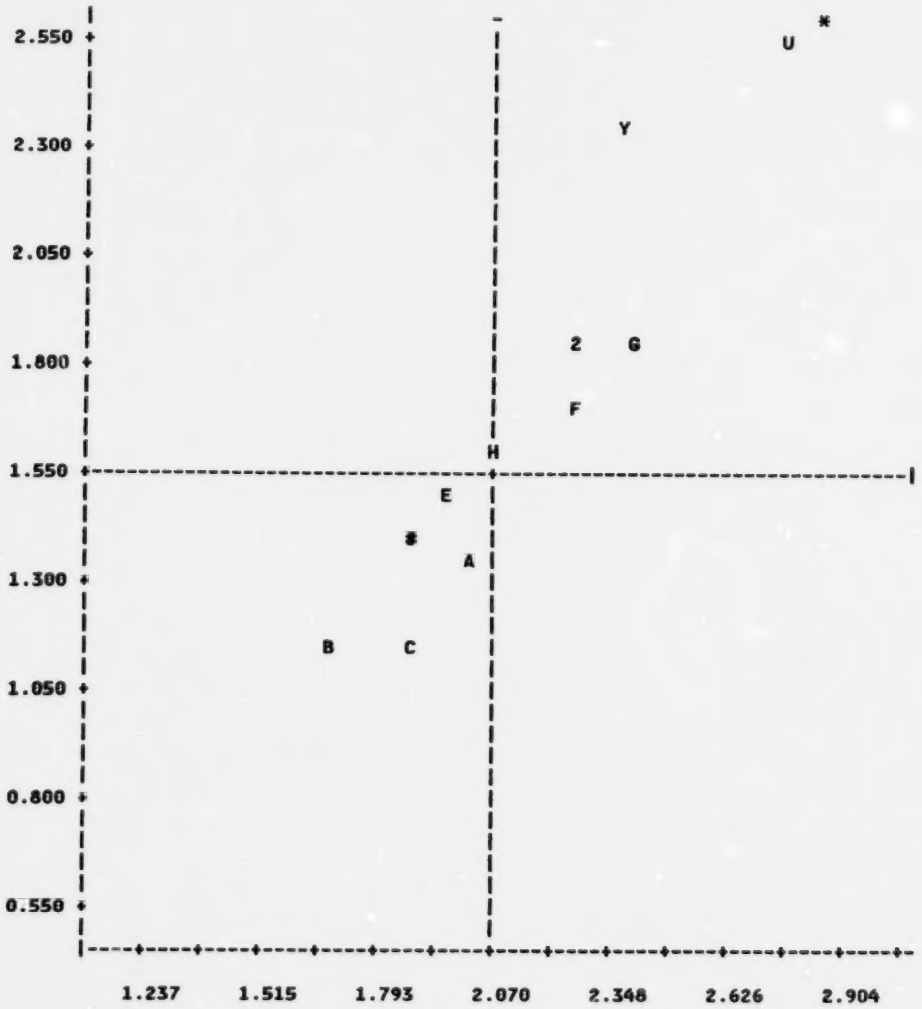
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 23 = H
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 69 = X
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	2.628	2.614
MEDIAN	2.634	2.624
STANDARD DEVIATION	0.015	0.038
STANDARD ERROR OF THE MEAN	0.004	0.010

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 1
NW = 2
SW = 4

TEST 28: ABSORPTION (FINE AGGREGATE)
SCATTER PLOT ANALYSIS
SCALE: 0.111 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

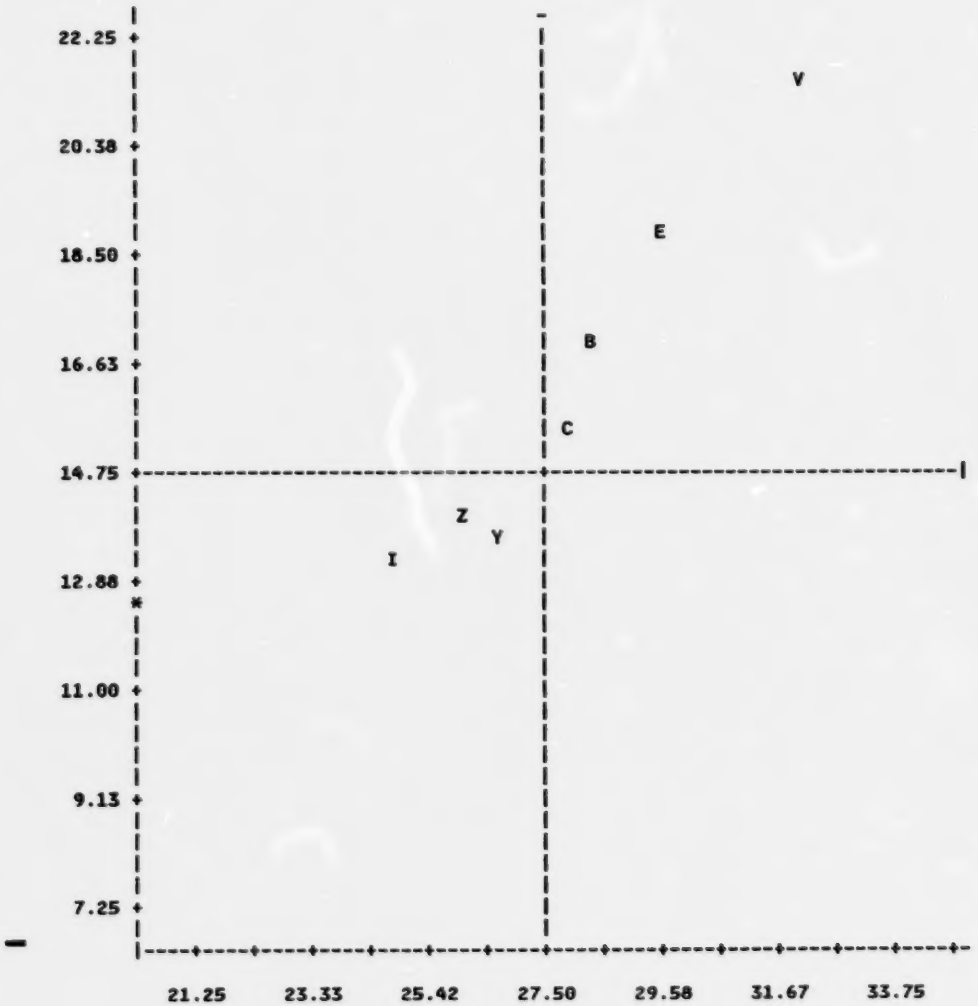
LAB. NO. 1	= A
LAB. NO. 4	= C
LAB. NO. 5	= D
LAB. NO. 14	= F
LAB. NO. 16	= G
LAB. NO. 23	= H
LAB. NO. 27	= I
LAB. NO. 66	= U
LAB. NO. 67	= V
LAB. NO. 69	= X
LAB. NO. 70	= Y
LAB. NO. 74	= 2
LAB. NO. 6	= E
LAB. NO. 2	= B

	MATERIAL 1	MATERIAL 2
MEAN	2.184	1.723
MEDIAN	2.071	1.550
STANDARD DEVIATION	0.356	0.512
STANDARD ERROR OF THE MEAN	0.095	0.137

NO OF POINTS IN EACH QUADRANT

NE =	5
SE =	0
NW =	1
SW =	7

TEST 29: MAGNESIUM SULFATE SOUNDNESS LOSS, % (FINE AGGREGATE)
SCATTER PLOT ANALYSIS — HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.833 UNITS=1 CM — VERTICAL AXIS: MATERIAL 2



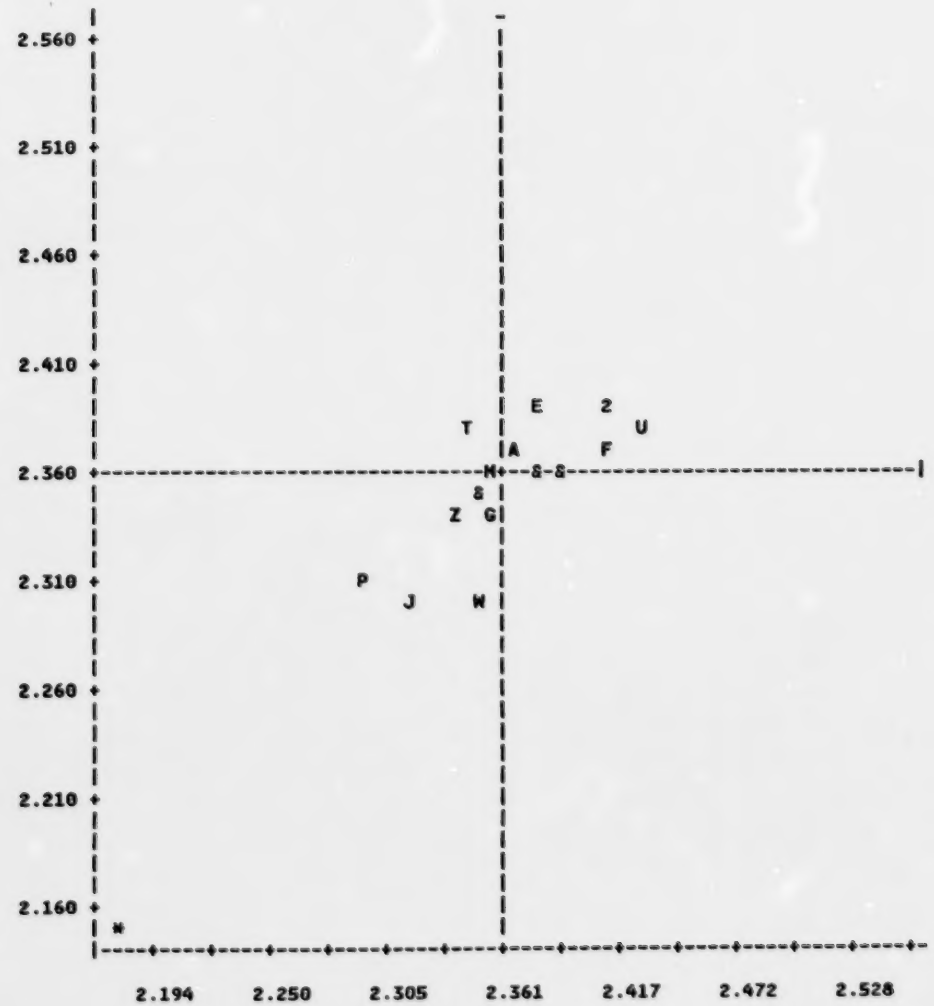
LEGEND
======
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 27 = I
LAB. NO. 67 = V
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	27.100	15.712
MEDIAN	27.500	14.750
STANDARD DEVIATION	3.741	2.966
STANDARD ERROR OF THE MEAN	1.323	1.049

NO OF POINTS IN EACH QUADRANT
NE = 4
SE = 0
NW = 0
SW = 3

TEST 31: MAXIMUM WET DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS
SCALE: 0.022 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1	= A
LAB. NO. 4	= C
LAB. NO. 5	= D
LAB. NO. 14	= F
LAB. NO. 16	= G
LAB. NO. 27	= I
LAB. NO. 38	= J
LAB. NO. 53	= M
LAB. NO. 58	= O
LAB. NO. 60	= P
LAB. NO. 64	= T
LAB. NO. 66	= U
LAB. NO. 67	= V
LAB. NO. 68	= W
LAB. NO. 70	= Y
LAB. NO. 71	= Z
LAB. NO. 74	= 2
LAB. NO. 6	= E
LAB. NO. 2	= B

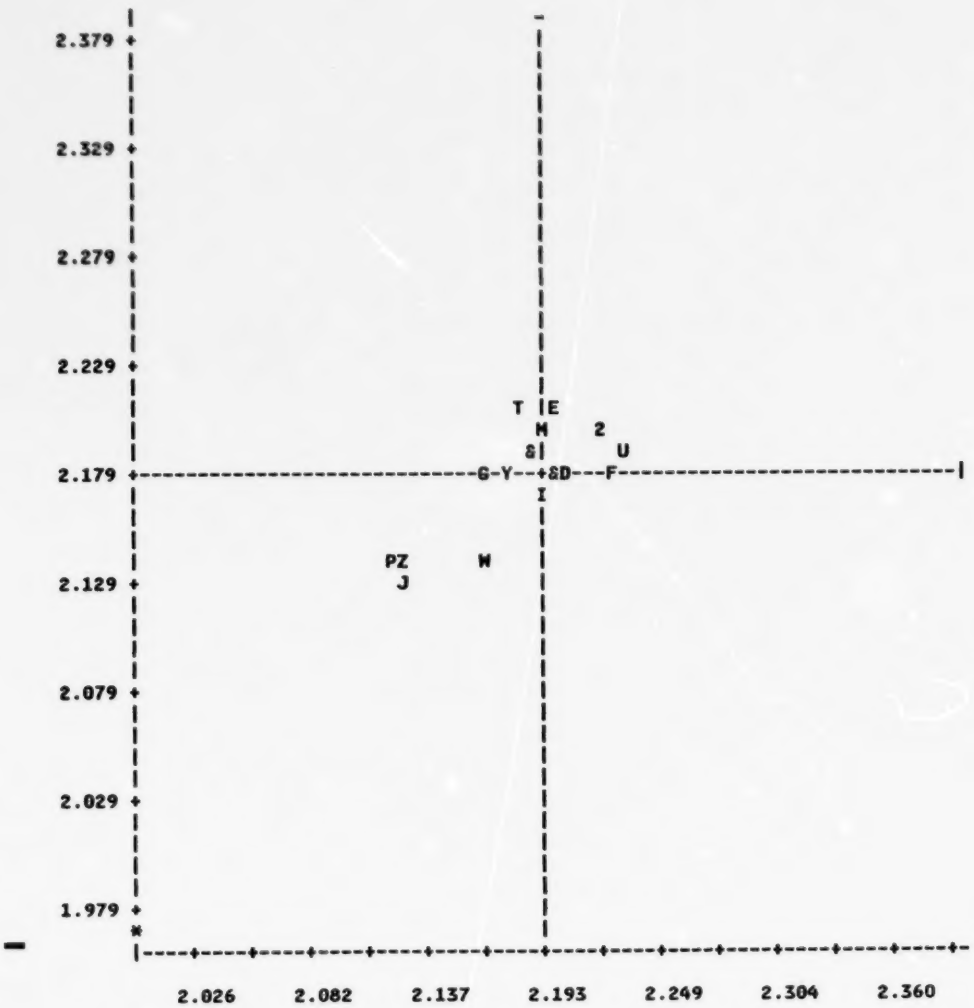
	MATERIAL 1	MATERIAL 2
MEAN	2.362	2.344
MEDIAN	2.361	2.360
STANDARD DEVIATION	0.035	0.025
STANDARD ERROR OF THE MEAN	0.008	0.006

NO OF POINTS IN EACH QUADRANT

NE =	9
SE =	0
NW =	2
SW =	7

TEST 32: MAXIMUM DRY DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS
SCALE: 0.022 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

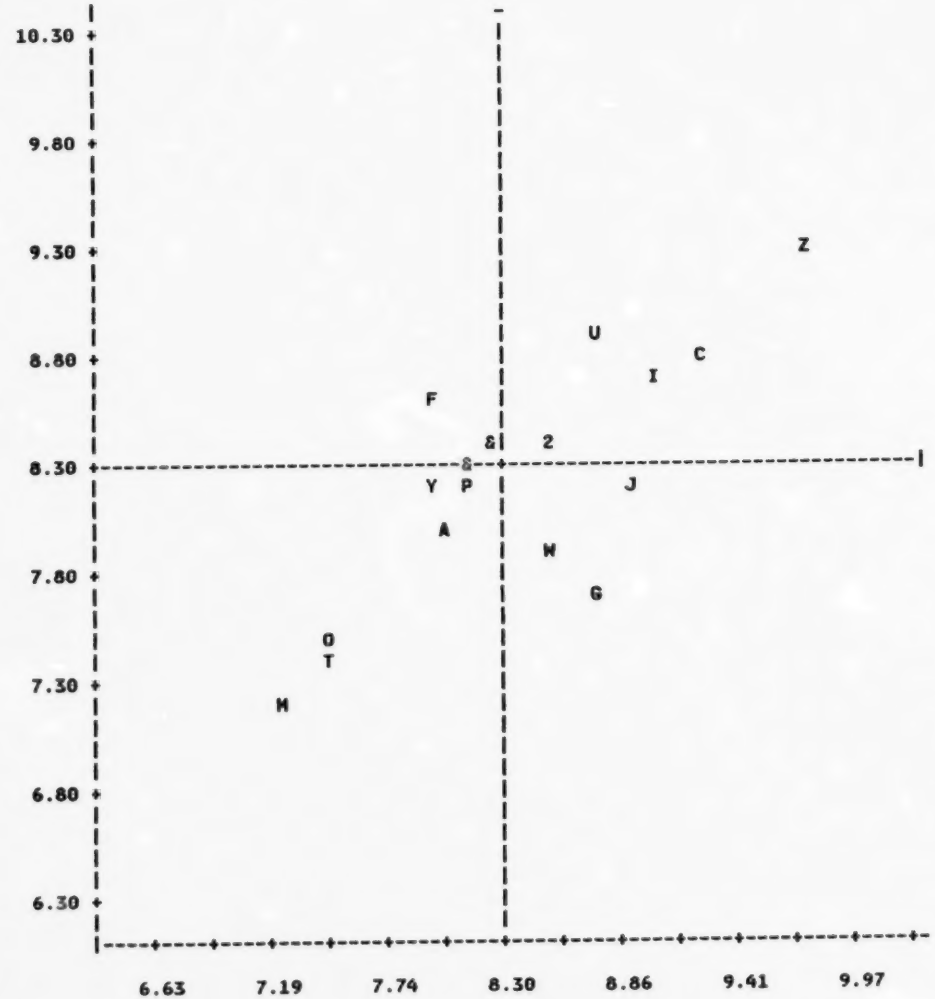
LAB. NO. 1	= A
LAB. NO. 4	= C
LAB. NO. 5	= D
LAB. NO. 14	= F
LAB. NO. 16	= G
LAB. NO. 27	= I
LAB. NO. 38	= J
LAB. NO. 53	= M
LAB. NO. 58	= O
LAB. NO. 60	= P
LAB. NO. 64	= T
LAB. NO. 66	= U
LAB. NO. 67	= V
LAB. NO. 68	= W
LAB. NO. 70	= Y
LAB. NO. 71	= Z
LAB. NO. 74	= 2
LAB. NO. 6	= E
LAB. NO. 2	= B

	MATERIAL 1	MATERIAL 2
MEAN	2.176	2.164
MEDIAN	2.193	2.179
STANDARD DEVIATION	0.033	0.023
STANDARD ERROR OF THE MEAN	0.008	0.005

NO OF POINTS IN EACH QUADRANT

NE =	7
SE =	0
NW =	6
SW =	5

TEST 33: OPTIMUM MOISTURE, % (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.222 UNITS=1 CM VERTICAL AXIS: MATERIAL 2



LEGEND
======

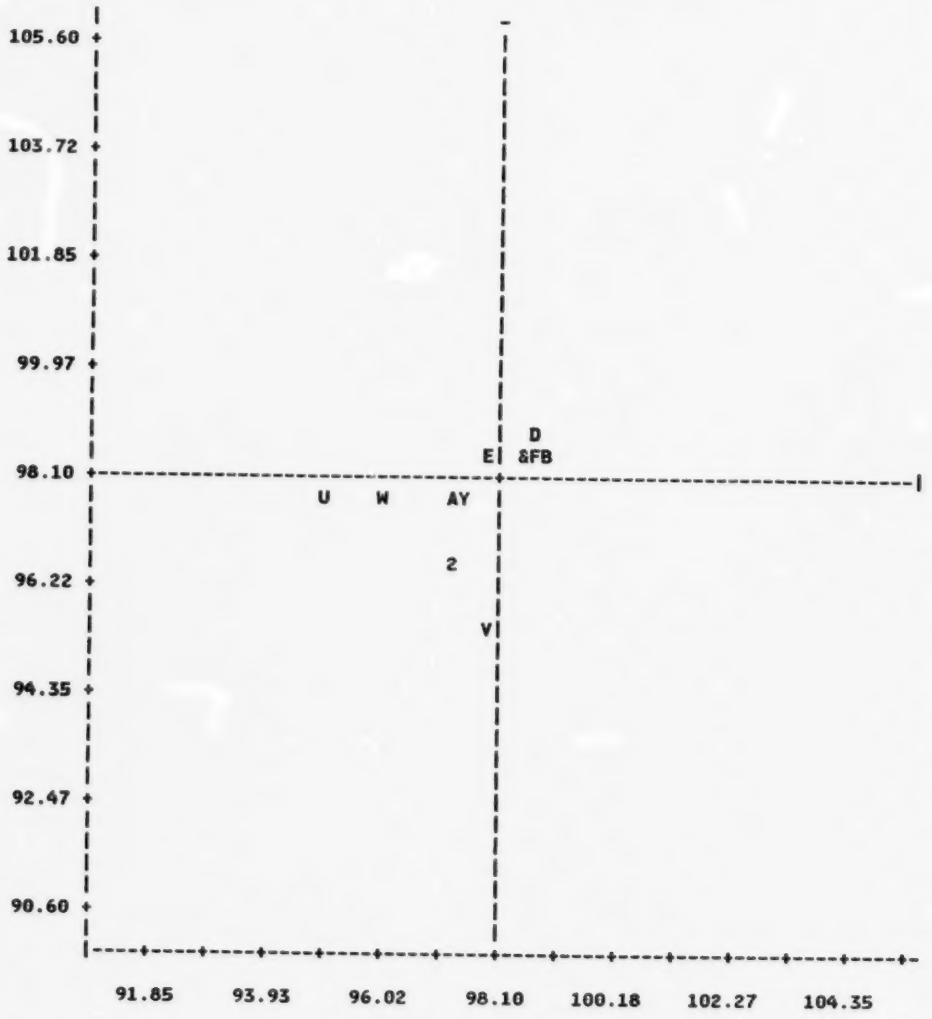
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 16 = G
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 53 = M
LAB. NO. 58 = O
LAB. NO. 60 = P
LAB. NO. 64 = T
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	8.400	8.242
MEDIAN	8.300	8.300
STANDARD DEVIATION	0.641	0.495
STANDARD ERROR OF THE MEAN	0.147	0.114

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 3
NW = 5
SW = 6

TEST 40: PERCENT PASSED ON 2.00 MM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

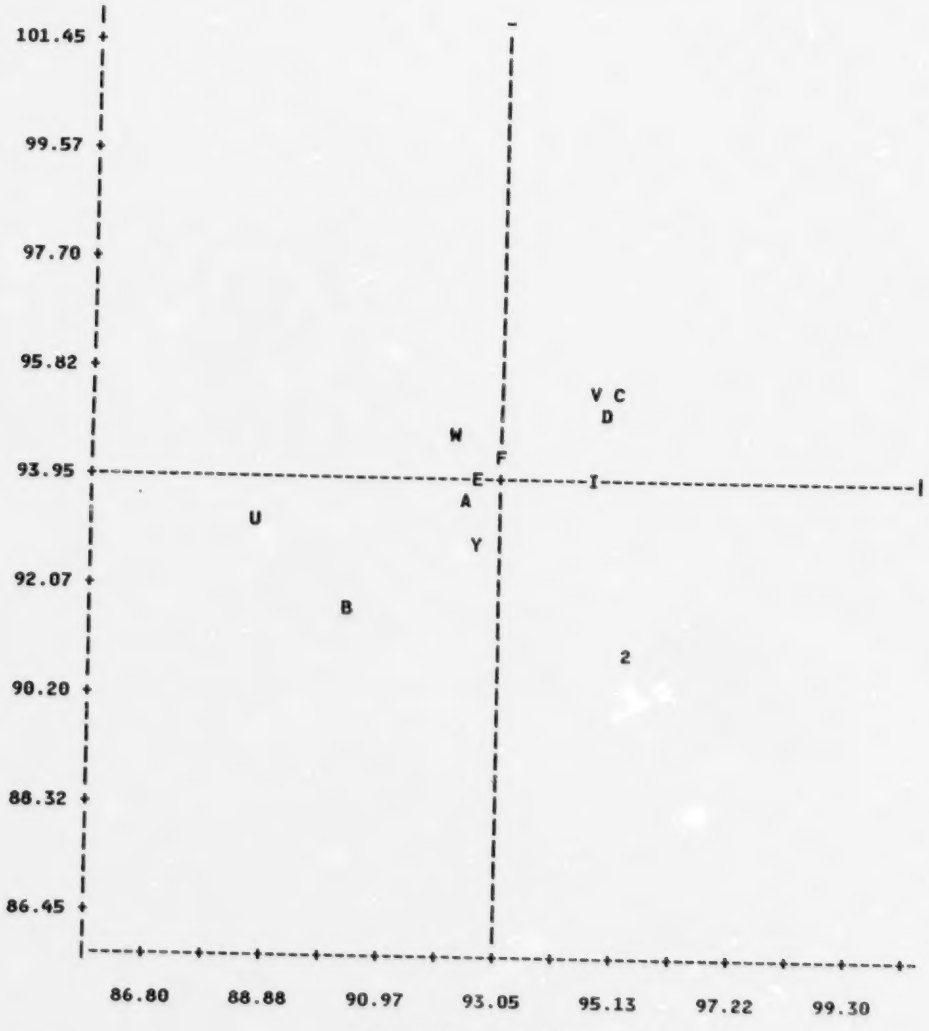
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	97.892	97.867
MEDIAN	98.100	98.100
STANDARD DEVIATION	0.871	0.445
STANDARD ERROR OF THE MEAN	0.251	0.128

NO OF POINTS IN EACH QUADRANT
NE = 5
SE = 0
NW = 1
SW = 6

TEST 41: PERCENT PASSED ON 425 MM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

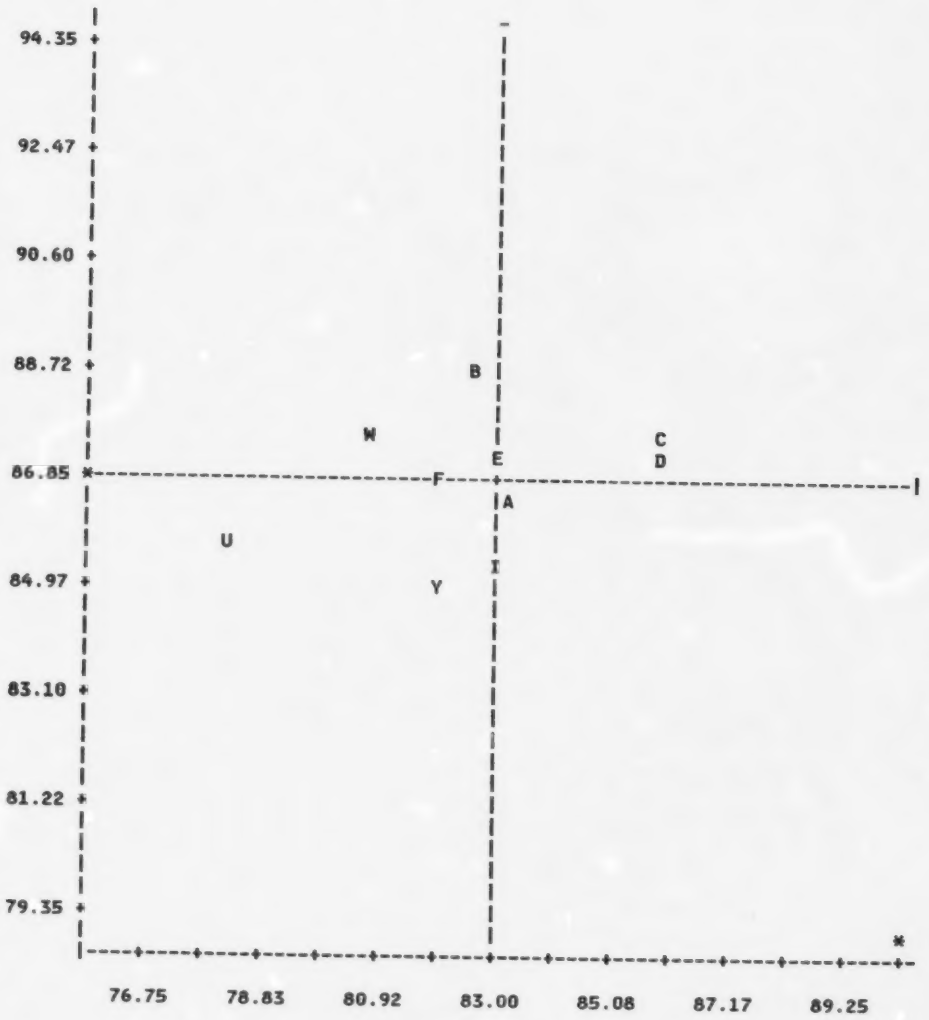
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	93.300	93.783
MEDIAN	93.050	93.950
STANDARD DEVIATION	2.054	1.352
STANDARD ERROR OF THE MEAN	0.593	0.390

NO OF POINTS IN EACH QUADRANT
NE = 4
SE = 1
NW = 3
SW = 4

TEST 42: PERCENT PASSED ON 75 UM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

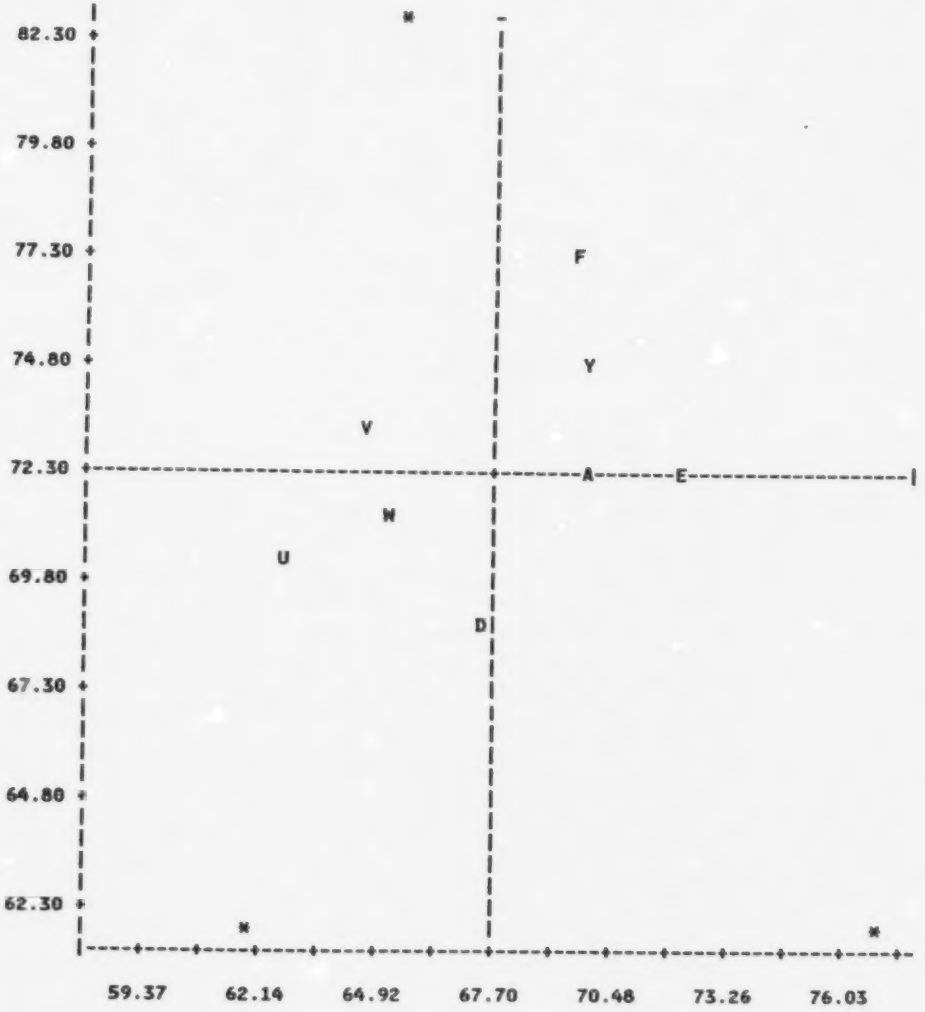
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	83.008	86.092
MEDIAN	83.000	86.850
STANDARD DEVIATION	4.678	1.058
STANDARD ERROR OF THE MEAN	1.351	0.306

NO OF POINTS IN EACH QUADRANT
NE = 2
SE = 1
NW = 4
SW = 3

TEST 43: PERCENT PASSED ON 20 UM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 1.111 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

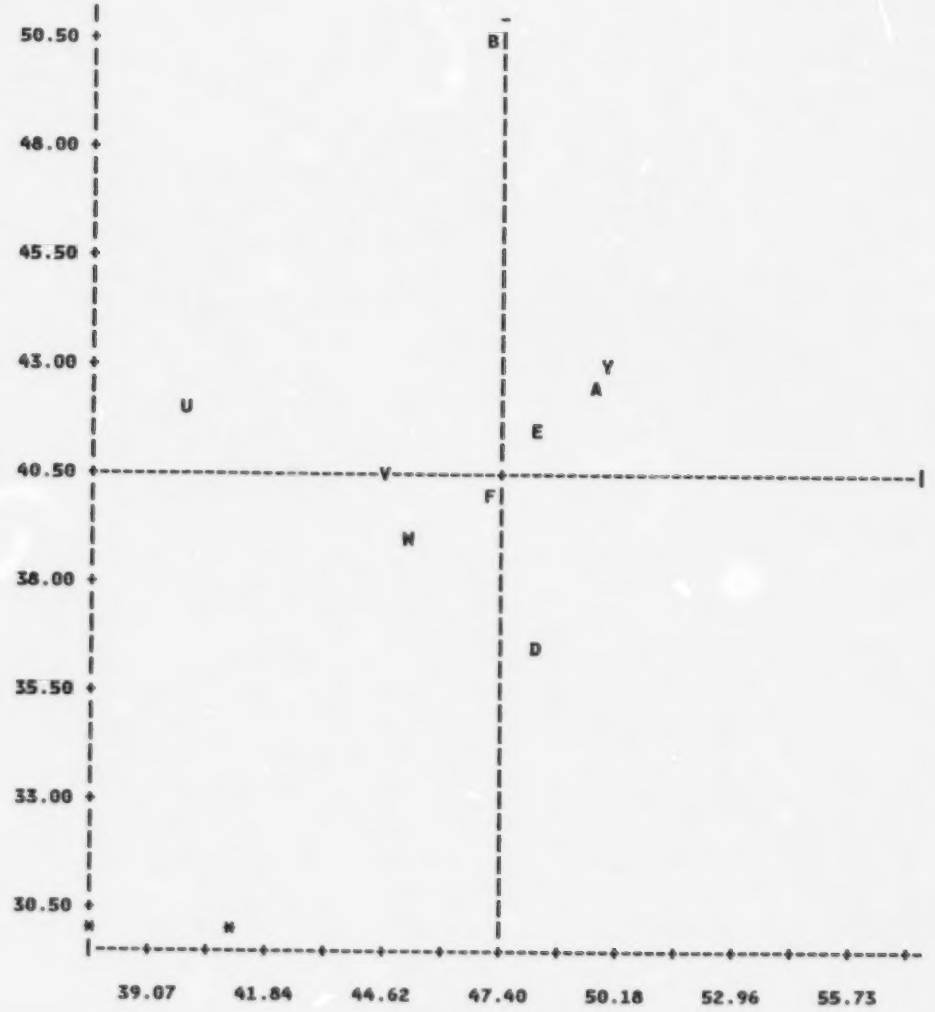
LAB. NO. 1 = A
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = Z
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	68.073	70.509
MEDIAN	67.700	72.300
STANDARD DEVIATION	4.475	5.383
STANDARD ERROR OF THE MEAN	1.349	1.623

NO OF POINTS IN EACH QUADRANT
NE = 4
SE = 0
NW = 1
SW = 3

TEST 44: PERCENT PASSED ON 5 UM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 1.111 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1 = A
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

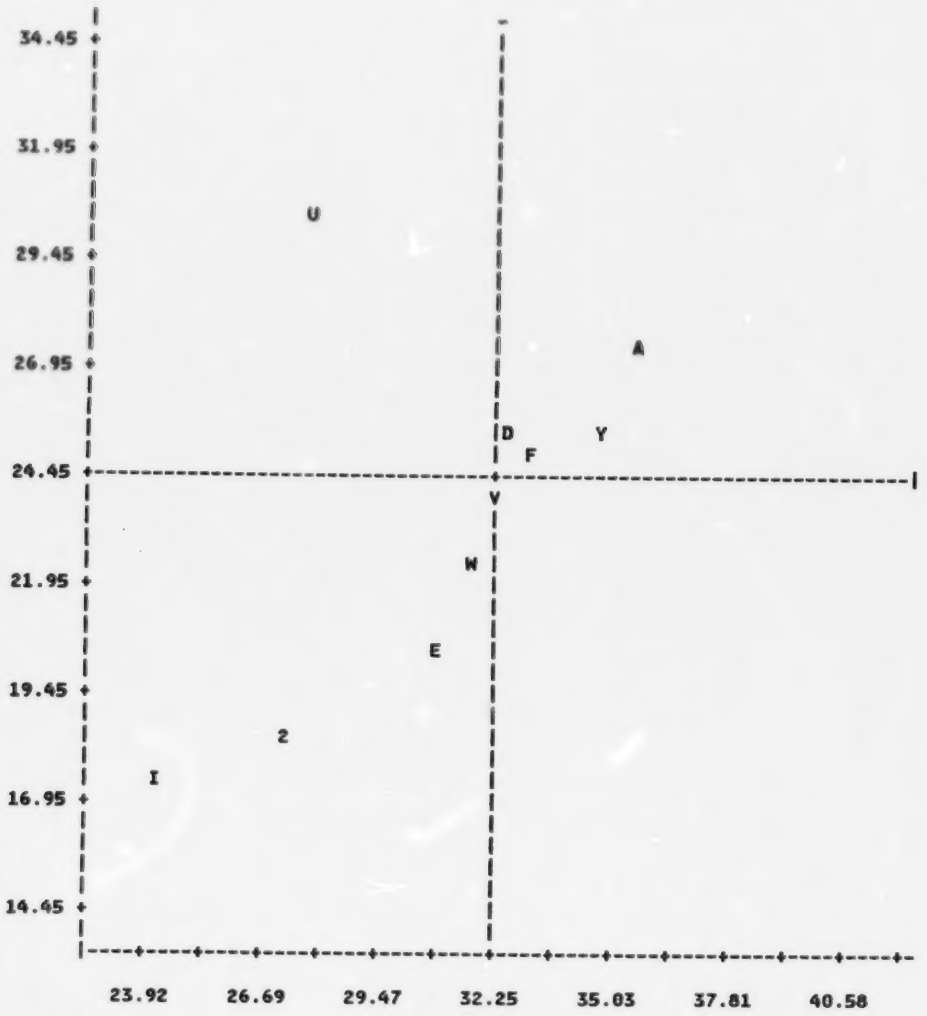
	MATERIAL 1	MATERIAL 2
MEAN	45.527	39.473
MEDIAN	47.400	40.500
STANDARD DEVIATION	4.386	5.857
STANDARD ERROR OF THE MEAN	1.322	1.766

NO OF POINTS IN EACH QUADRANT

NE = 3
SE = 1
NW = 3
SW = 2

TEST 45: PERCENT PASSED ON 2 UM SIEVE (PARTICLE SIZE ANALYSIS)
SCATTER PLOT ANALYSIS
SCALE: 1.111 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

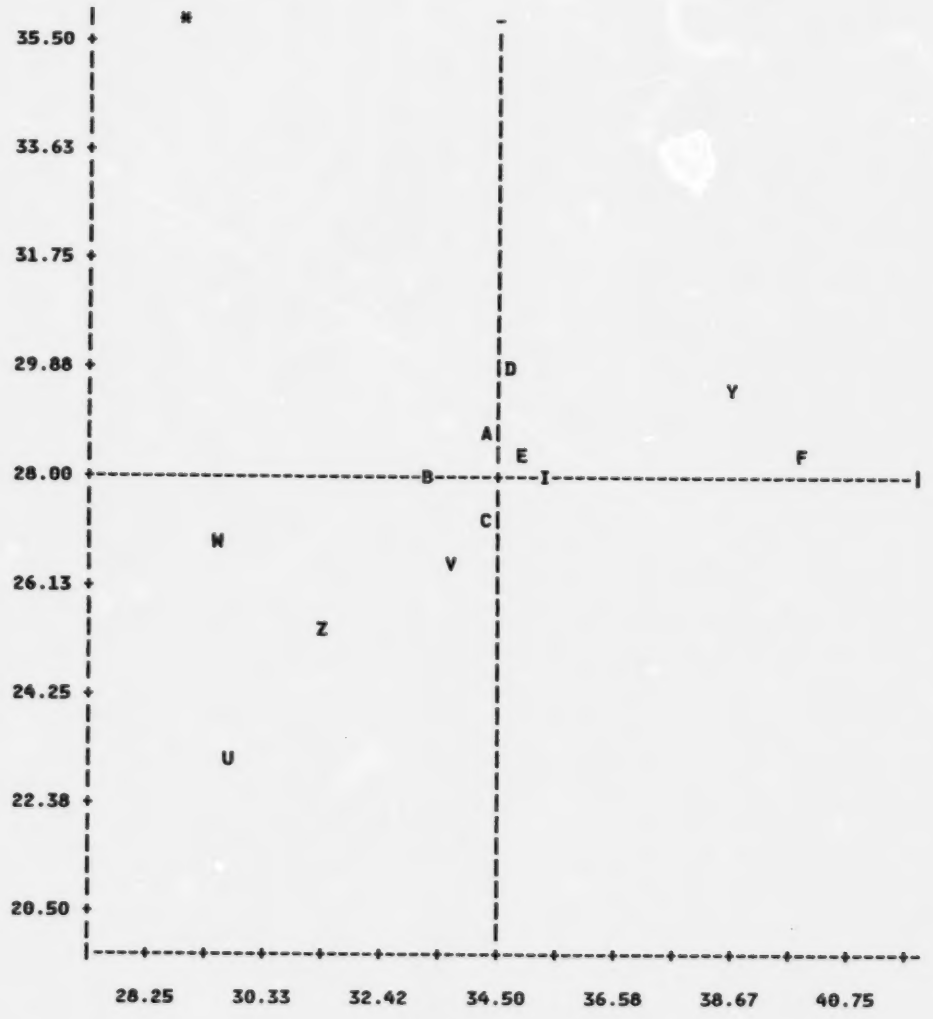
LAB. NO. 1 = A
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E

	MATERIAL 1	MATERIAL 2
MEAN	31.290	23.700
MEDIAN	32.250	24.450
STANDARD DEVIATION	3.597	3.787
STANDARD ERROR OF THE MEAN	1.137	1.198

NO OF POINTS IN EACH QUADRANT
NE = 4
SE = 0
NW = 1
SW = 5

TEST 46: LIQUID LIMIT, %
SCATTER PLOT ANALYSIS
SCALE: 0.833 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

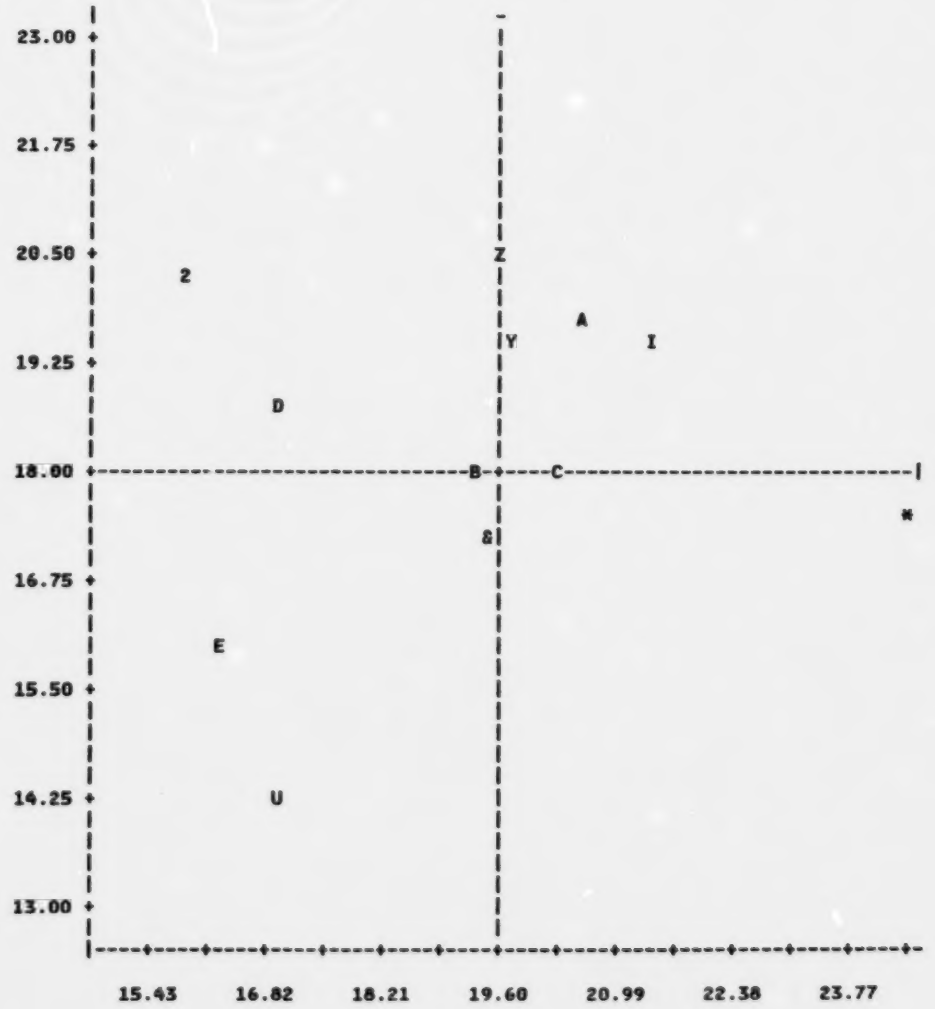
	MATERIAL 1	MATERIAL 2
MEAN	33.938	28.200
MEDIAN	34.500	28.000
STANDARD DEVIATION	3.344	1.210
STANDARD ERROR OF THE MEAN	0.927	0.336

NO OF POINTS IN EACH QUADRANT

NE = 5
SE = 0
NW = 2
SW = 5

TEST 47: PLASTIC LIMIT, %
SCATTER PLOT ANALYSIS
SCALE: 0.556 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 71 = Z
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

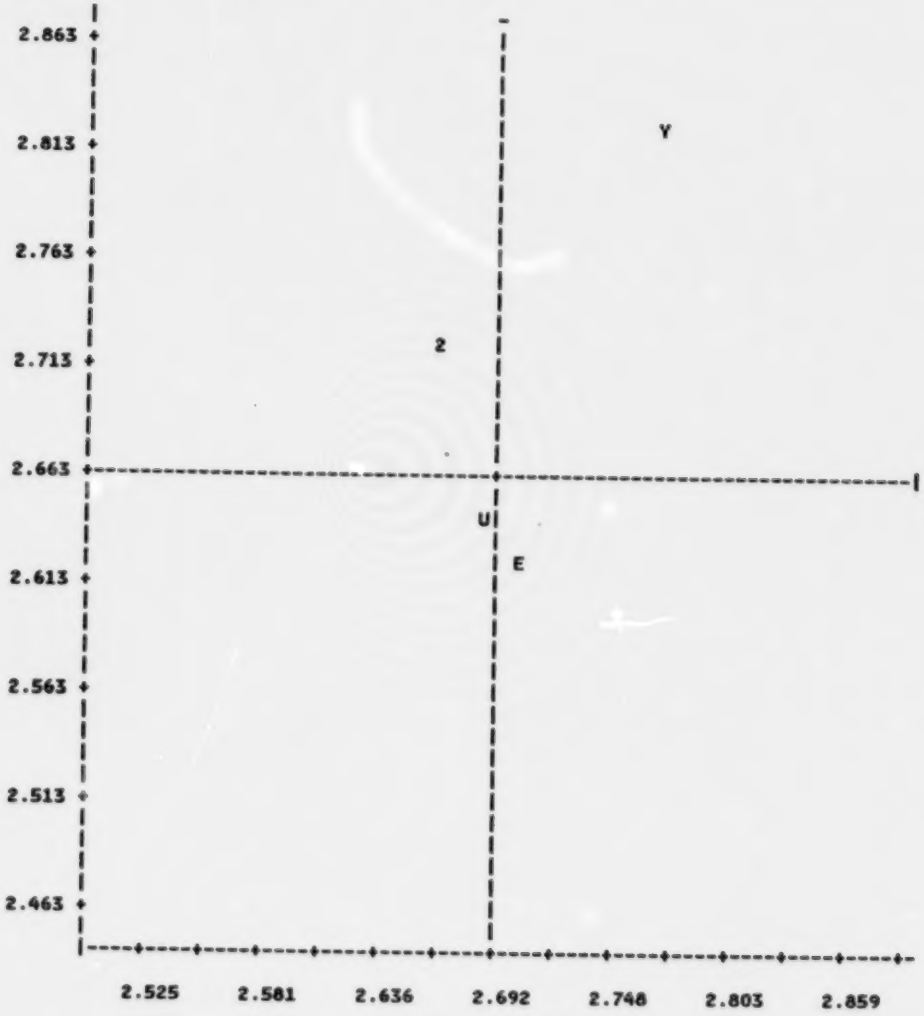
	MATERIAL 1	MATERIAL 2
MEAN	19.623	18.177
MEDIAN	19.600	18.000
STANDARD DEVIATION	1.847	1.637
STANDARD ERROR OF THE MEAN	0.512	0.454

NO OF POINTS IN EACH QUADRANT

NE = 4
SE = 0
NW = 4
SW = 4

TEST 49: RELATIVE DENSITY
SCATTER PLOT ANALYSIS
SCALE: 0.022 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



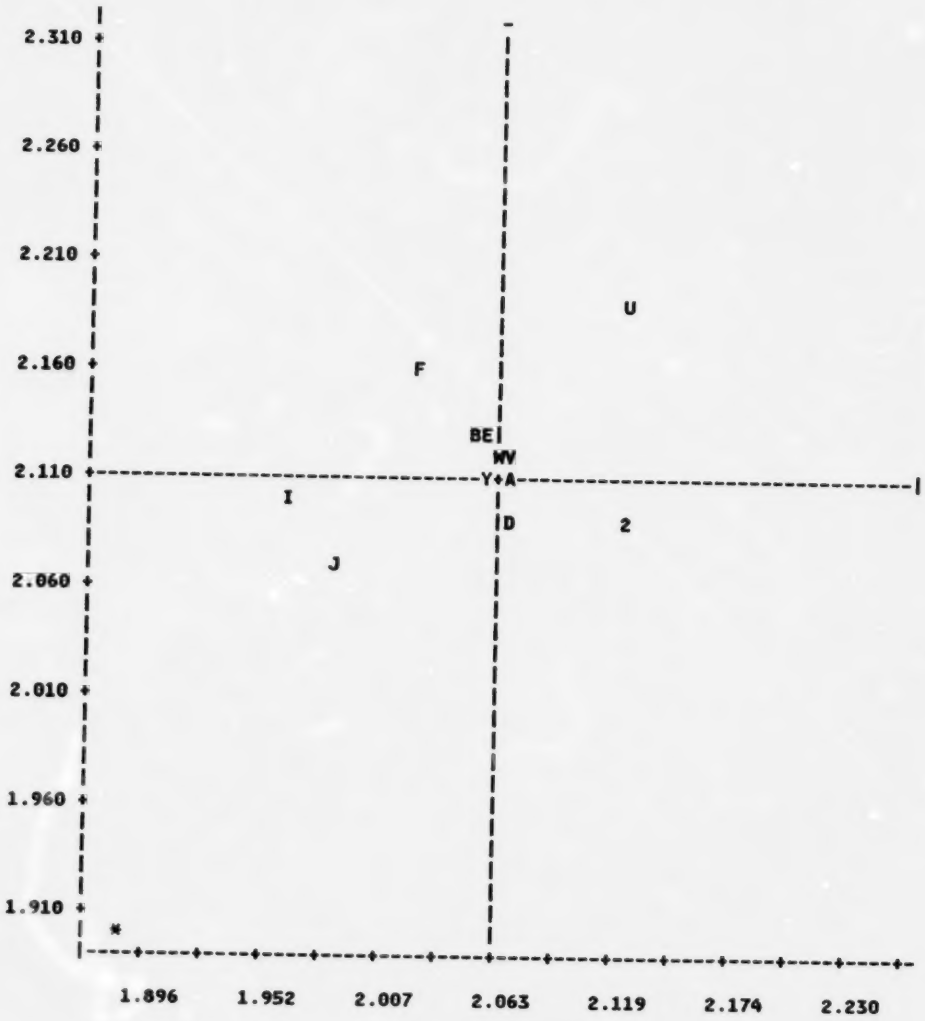
LEGEND
======
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E

	MATERIAL 1	MATERIAL 2
MEAN	2.668	2.692
MEDIAN	2.692	2.663
STANDARD DEVIATION	0.105	0.075
STANDARD ERROR OF THE MEAN	0.047	0.034

NO OF POINTS IN EACH QUADRANT
NE = 2
SE = 1
NW = 1
SW = 1

TEST 50: MAXIMUM WET DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS
SCALE: 0.022 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



LEGEND
======

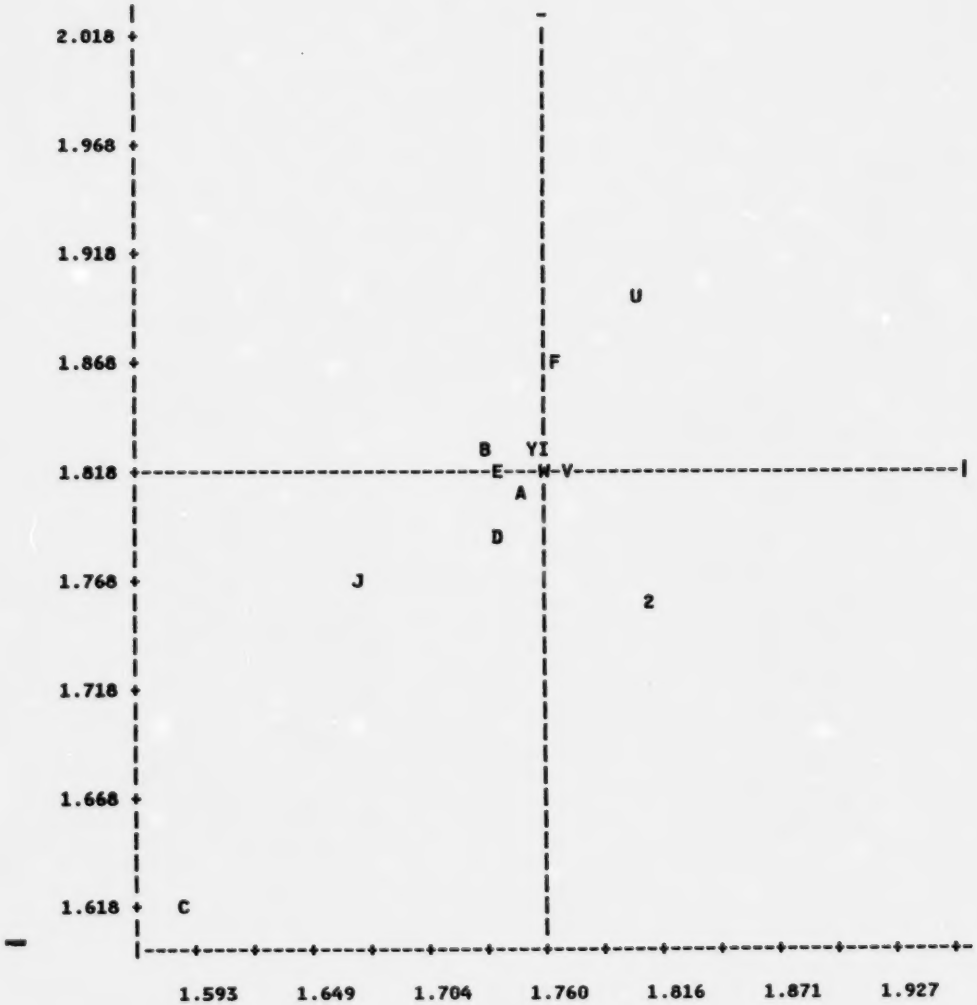
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	2.047	2.100
MEDIAN	2.063	2.110
STANDARD DEVIATION	0.048	0.029
STANDARD ERROR OF THE MEAN	0.013	0.008

NO OF POINTS IN EACH QUADRANT
NE = 3
SE = 2
NW = 5
SW = 2

TEST 51: MAXIMUM DRY DENSITY G/CM3 (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS
SCALE: 0.022 UNITS=1 CM

HORIZONTAL AXIS: MATERIAL 1
VERTICAL AXIS: MATERIAL 2



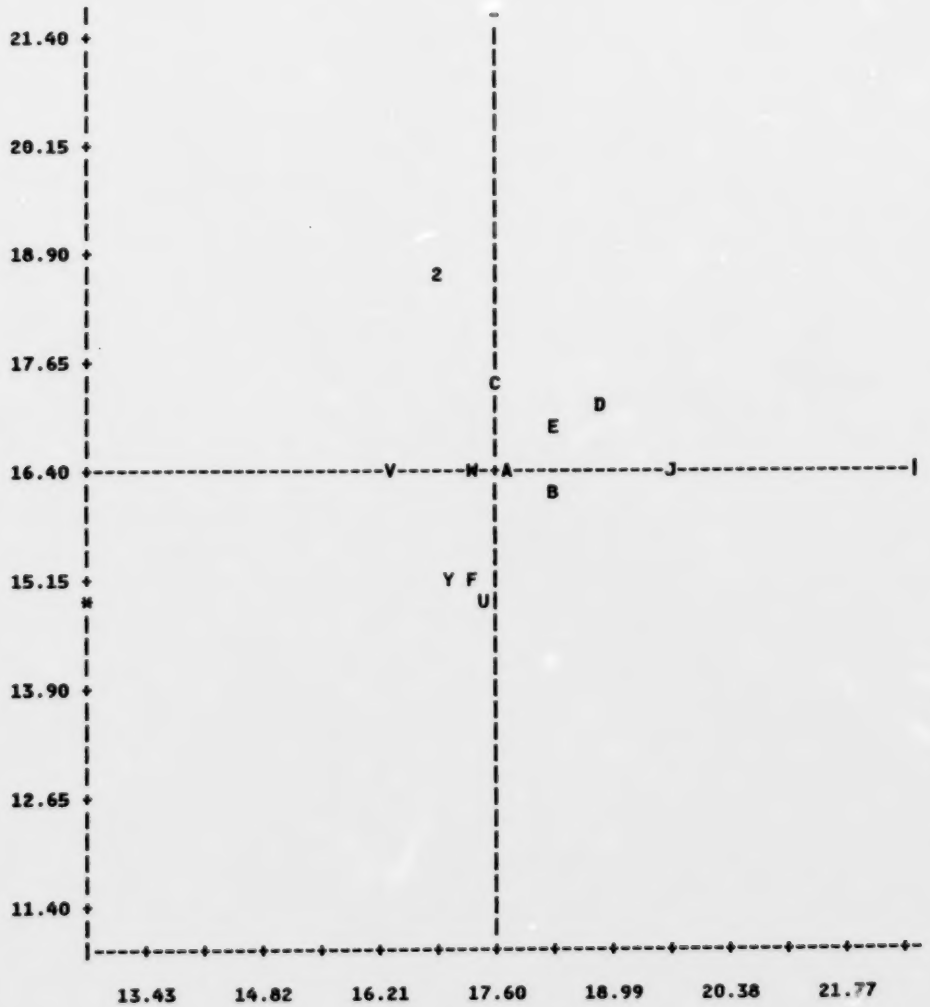
LEGEND
======

LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	1.747	1.805
MEDIAN	1.760	1.818
STANDARD DEVIATION	0.036	0.037
STANDARD ERROR OF THE MEAN	0.010	0.010

NO OF POINTS IN EACH QUADRANT
NE = 3
SE = 1
NW = 5
SW = 4

TEST 52: OPTIMUM MOISTURE, % (MOISTURE - DENSITY RELATIONSHIP)
SCATTER PLOT ANALYSIS HORIZONTAL AXIS: MATERIAL 1
SCALE: 0.556 UNITS=1 CM VERTICAL AXIS: MATERIAL 2



LEGEND
======
LAB. NO. 1 = A
LAB. NO. 4 = C
LAB. NO. 5 = D
LAB. NO. 14 = F
LAB. NO. 27 = I
LAB. NO. 38 = J
LAB. NO. 66 = U
LAB. NO. 67 = V
LAB. NO. 68 = W
LAB. NO. 70 = Y
LAB. NO. 74 = 2
LAB. NO. 6 = E
LAB. NO. 2 = B

	MATERIAL 1	MATERIAL 2
MEAN	17.392	16.315
MEDIAN	17.600	16.400
STANDARD DEVIATION	0.917	1.015
STANDARD ERROR OF THE MEAN	0.254	0.281

NO OF POINTS IN EACH QUADRANT
NE = 4
SE = 1
NW = 4
SW = 3